



**Count on it.**

Form No. 3437-336 Rev B

# Operator's Manual

## **Z Master® Professional 2000 Series Riding Mower** with 48in, 52in, or 60in TURBO FORCE® Mower

Model No. 74490—Serial No. 400000000 and Up

Model No. 74491—Serial No. 400000000 and Up

Model No. 74492—Serial No. 400000000 and Up

Model No. 74493—Serial No. 400000000 and Up

Model No. 74494—Serial No. 400000000 and Up

Model No. 74495—Serial No. 400000000 and Up

Model No. 74496—Serial No. 400000000 and Up

Model No. 74497—Serial No. 400000000 and Up



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

**Gross or Net Torque:** The gross or net torque of this engine was laboratory rated by the engine manufacturer in accordance with the Society of Automotive Engineers (SAE) J1940 or J2723. As configured to meet safety, emission, and operating requirements, the actual engine torque on this class of mower will be significantly lower. Please refer to the engine manufacturer's information included with the machine.

**Important:** If you are using a machine with a Toro engine above 1500 m (5,000 ft) for a continuous period, ensure that the High Altitude Kit has been installed so that the engine meets CARB/EPA emission regulations. The High Altitude Kit increases engine performance while preventing spark-plug fouling, hard starting, and increased emissions. Once you have installed the kit, attach the high-altitude label next to the serial decal on the machine. Contact any Authorized Toro Service Dealer to obtain the proper High Altitude Kit and high-altitude label for your machine. To locate a dealer convenient to you, access our website at [www.Toro.com](http://www.Toro.com) or contact our Toro Customer Care Department at the number(s) listed in your Emission Control Warranty Statement.

Remove the kit from the engine and restore the engine to its original factory configuration when running the engine under 1500 m (5,000 ft). Do not operate an engine that has been converted for high-altitude use at lower altitudes; otherwise, you could overheat and damage the engine.

If you are unsure whether or not your machine has been converted for high-altitude use, look for the following label.

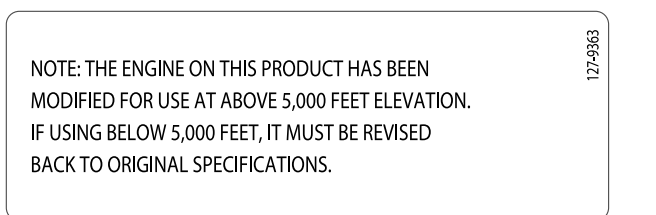


Figure 4

## ⚠ WARNING

### CALIFORNIA Proposition 65 Warning

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

**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.**

**Use of this product may cause exposure to chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.**

## Introduction

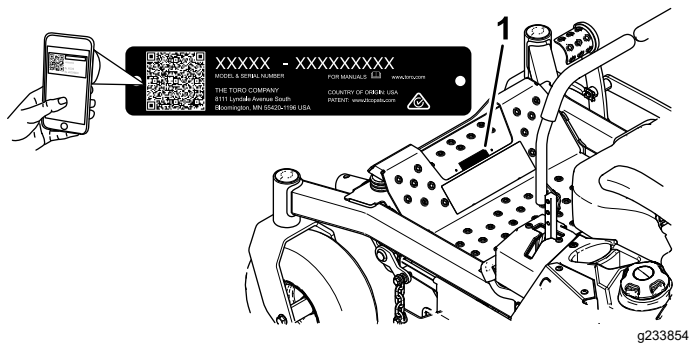
This rotary-blade, riding lawn mower is intended to be used by professional, hired operators. It is designed primarily for cutting grass on well-maintained lawns on residential or commercial properties. Using this product for purposes other than its intended use could prove dangerous to you and bystanders.

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.

Visit [www.Toro.com](http://www.Toro.com) for product safety and operation training materials, 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](#) or [Figure 2](#) identifies the location of the model and serial numbers on the product. Write the numbers in the space provided.

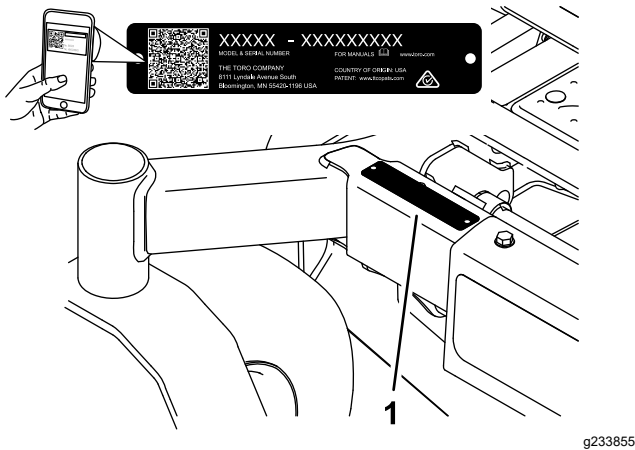
**Important:** With your mobile device, you can scan the QR code on the serial number decal (if equipped) to access warranty, parts, and other product information.



**Figure 1**

Machines without MyRide

1. Model and serial number location



**Figure 2**

Machines with MyRide

Model No. _____
Serial No. _____

This manual identifies potential hazards and has safety messages identified by the safety-alert symbol (Figure 3), which signals a hazard that may cause serious injury or death if you do not follow the recommended precautions.



**Figure 3**

Safety-alert symbol

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

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# Safety

This machine has been designed in accordance with ANSI standard B71.4-2017.

## Safety Alert Symbol

This Safety Alert Symbol (Figure 5) is used both in this manual and on the machine to identify important safety messages which must be followed to avoid accidents.

This symbol means: **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**



g000502

**Figure 5**  
Safety Alert Symbol

---

The safety alert symbol appears above information which alerts you to unsafe actions or situations and will be followed by the word **DANGER**, **WARNING**, or **CAUTION**.

**DANGER:** Indicates an imminently hazardous situation which, if not avoided, **Will** result in death or serious injury.

**WARNING:** Indicates a potentially hazardous situation which, if not avoided, **Could** result in death or serious injury.

**CAUTION:** Indicates a potentially hazardous situation which, if not avoided, **May** result in minor or moderate injury.

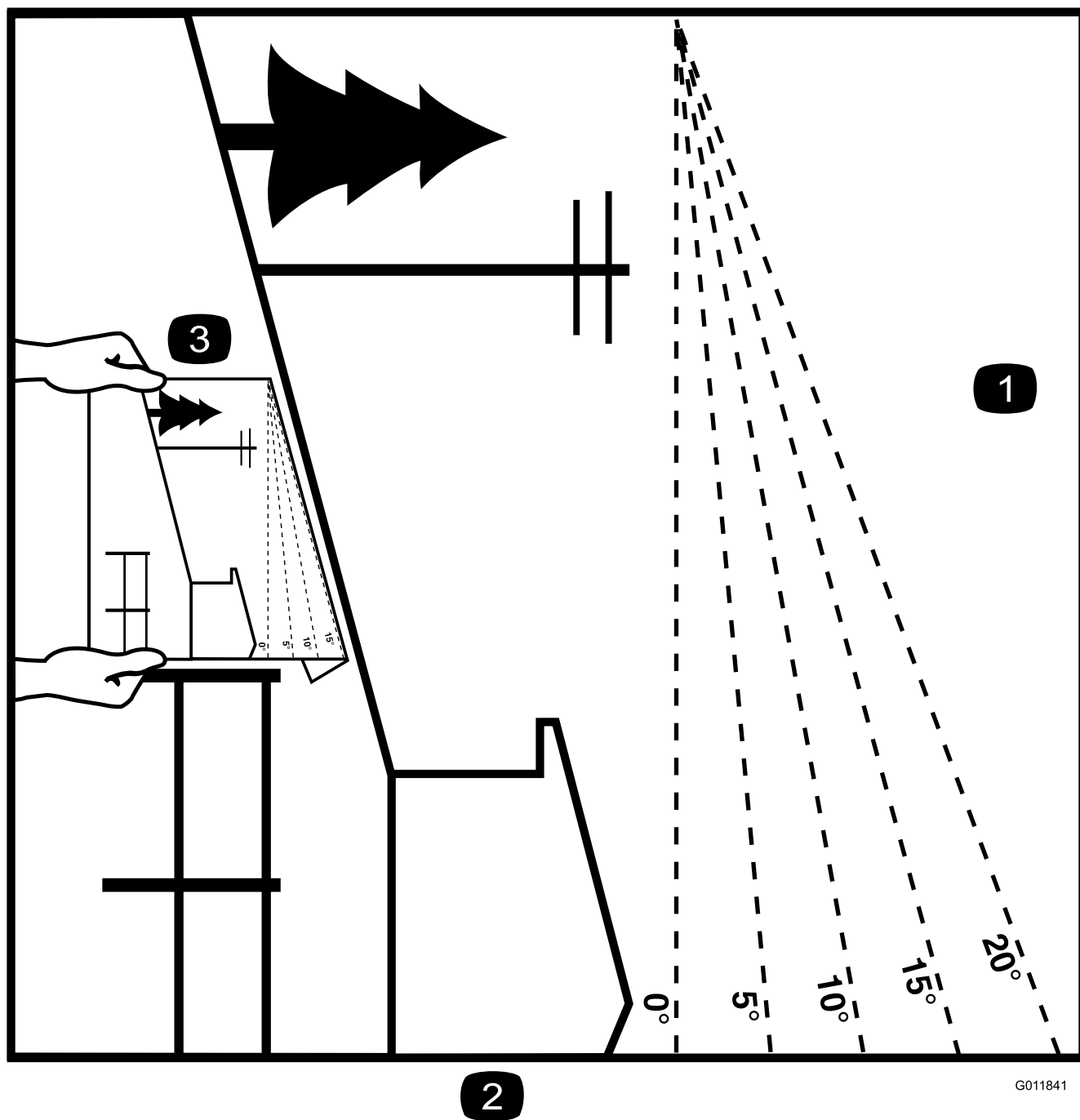
This manual uses two other words to highlight information. **Important** calls attention to special mechanical information and **Note** emphasizes general information worthy of special attention.

## General Safety

This machine is capable of amputating hands and feet and of throwing objects. Toro designed and tested this lawn mower to offer reasonably safe service; however, failure to comply with safety instructions may result in injury or death.

- Read, understand, and follow all instructions and warnings in the Operator's Manual and other training material, on the machine, engine, and attachments. All operators and mechanics should be trained. If the operator(s) or mechanic(s) can not read this manual, it is the owner's responsibility to explain this material to them; other languages may be available on our website.
- Only allow trained, responsible, and physically capable operators that are familiar with the safe operation, operator controls, and safety signs and instructions to operate the machine. Never let children or untrained people operate or service the equipment. Local regulations may restrict the age of the operator.
- Always keep the roll bar in the fully raised and locked position and use the seat belt.
- Do not operate the machine near drop-offs, ditches, embankments, water, or other hazards, or on slopes greater than 15 degrees.
- Do not put your hands or feet near moving components of the machine.
- Never operate the machine with damaged guards, shields, or covers. Always have safety shields, guards, switches and other devices in place and in proper working condition.
- Stop the machine, shut off the engine, and remove the key before servicing, fueling, or unclogging the machine.

# Slope Indicator



G011841

g011841

**Figure 6**

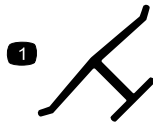
You may copy this page for personal use.

1. The maximum slope you can operate the machine on is **15 degrees**. Use the slope chart to determine the degree of slope of hills before operating. **Do not operate this machine on a slope greater than 15 degrees.** Fold along the appropriate line to match the recommended slope.
2. Align this edge with a vertical surface, a tree, building, fence pole, etc.
3. Example of how to compare slope with folded edge

# Safety and Instructional Decals



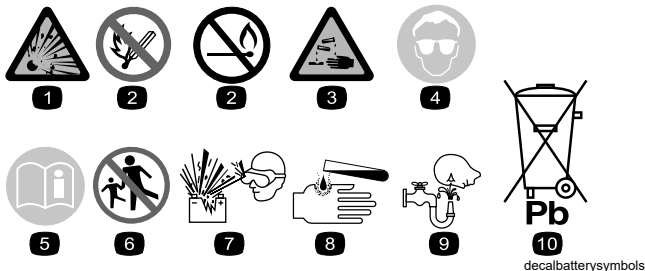
Safety decals and instructions are easily visible to the operator and are located near any area of potential danger. Replace any decal that is damaged or missing.



decaloemmarkt

## Manufacturer's Mark

1. This mark indicates that the blade is identified as a part from the original machine manufacturer.

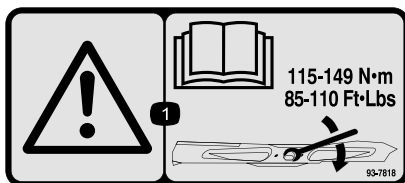


decalbatterysymbols

## Battery Symbols

Some or all of these symbols are on your battery.

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



decal93-7818

93-7818

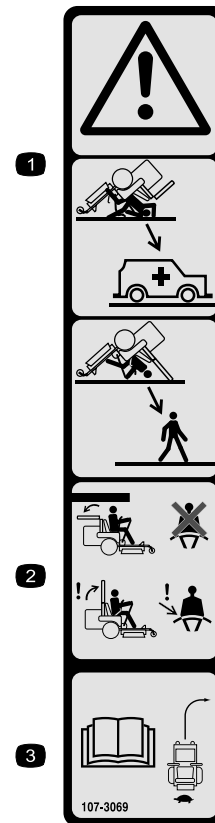
1. Warning—read the *Operator's Manual* for instructions on torquing the blade bolt/nut to 115 to 149 N·m (85 to 110 ft-lb).



decal106-5517

106-5517

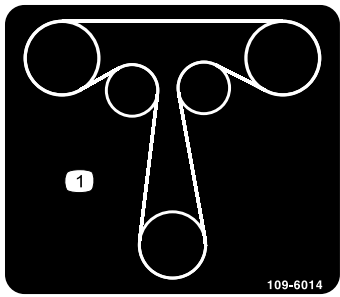
1. Warning—do not touch the hot surface.



decal107-3069

107-3069

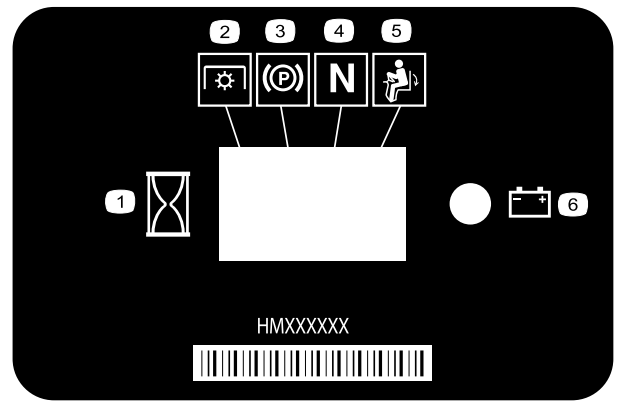
1. Warning—there is no rollover protection when the roll bar is down.
2. To avoid injury or death from a rollover accident, keep the roll bar in the raised and locked position and wear the seat belt. Lower the roll bar only when absolutely necessary; do not wear the seat belt when the roll bar is down.
3. Read the *Operator's Manual*; drive slowly and carefully.



**109-6014**

decal109-6014

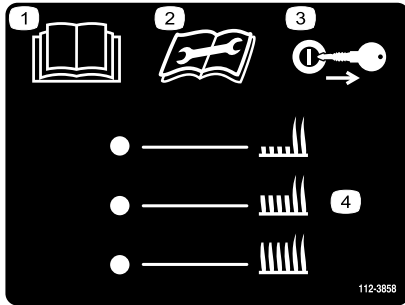
1. Traction belt routing



**116-5610**

decal116-5610

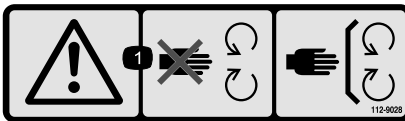
- |                         |                             |
|-------------------------|-----------------------------|
| 1. Hour meter           | 4. Neutral                  |
| 2. Power take-off (PTO) | 5. Operator presence switch |
| 3. Parking brake        | 6. Battery                  |



**112-3858**

decal112-3858

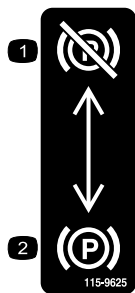
- |   |   |
|---|---|
| 1. Read the <i>Operator's Manual</i> .                              | 3. Remove the key before adjusting the height of cut. |
| 2. Read the <i>Operator's Manual</i> before performing maintenance. | 4. Height-of-cut settings                             |



**112-9028**

decal112-9028

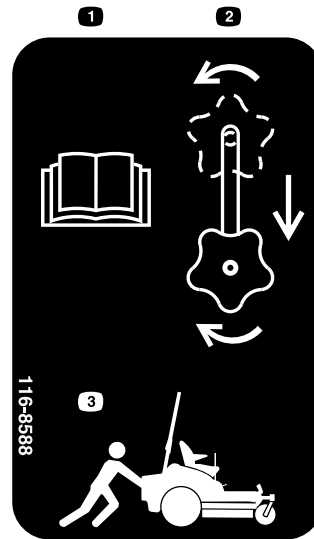
1. Warning—stay away from moving parts; keep all guards and shields in place.



**115-9625**

decal115-9625

- |                             |                          |
|-----------------------------|--------------------------|
| 1. Parking brake—disengaged | 2. Parking brake—engaged |
|-----------------------------|--------------------------|

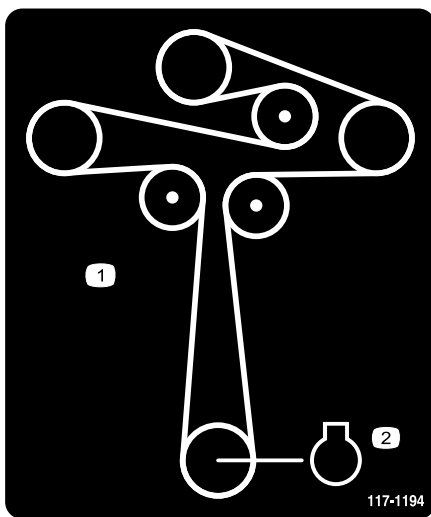


**116-8588**

decal116-8588

1. Read the *Operator's Manual*.
2. Rotate the drive release knob to loosen, slide the knob, and tighten.
3. Push the machine.





117-1194

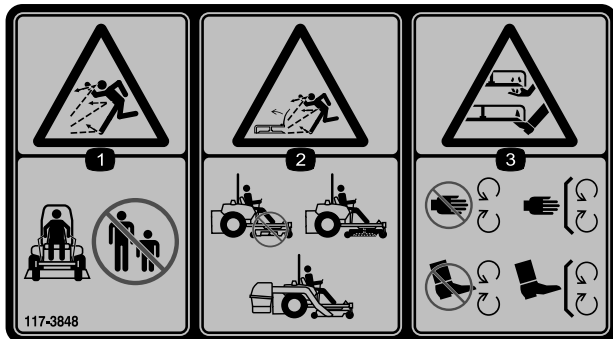
decal117-1194

1. Belt routing
2. Engine

**WARNING:** Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).  
For more information, please visit [www.tcoCAProp65.com](http://www.tcoCAProp65.com)  
**CALIFORNIA SPARK ARRESTER WARNING**  
Operation of this equipment may create sparks that can start fires around dry vegetation. A spark arrester may be required. The operator should contact local fire agencies for laws or regulations relating to fire prevention requirements.

133-8062

decal133-8062



117-3848

decal117-3848

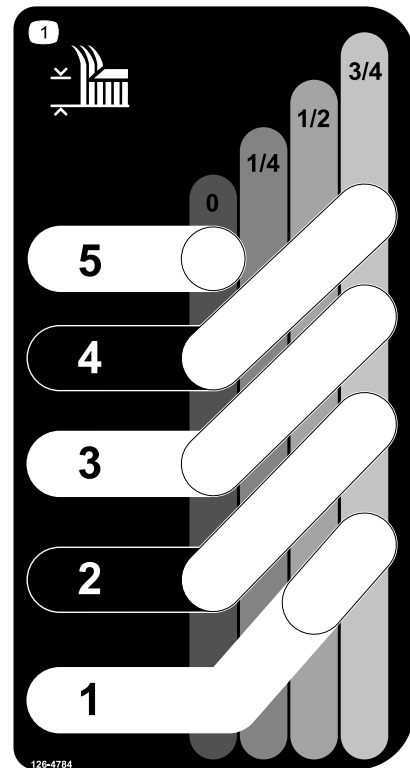
1. Thrown object hazard—keep bystanders away.
2. Thrown object hazard, raised deflector—do not operate without the deflector, discharge cover, or grass collection system in place.
3. Cutting/dismemberment hazard of hand or foot, mower blade—stay away from moving parts; keep all guards and shields in place.



126-4363

decal126-4363

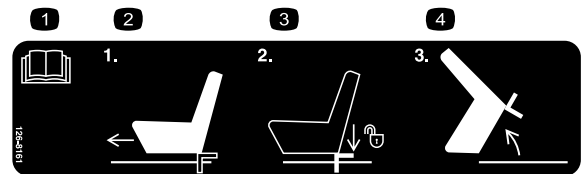
1. Cutting/dismemberment hazard, fan and entanglement hazard, belt. Shut off the engine and remove the key before adjusting, servicing or cleaning the machine.



126-4784

decal126-4784

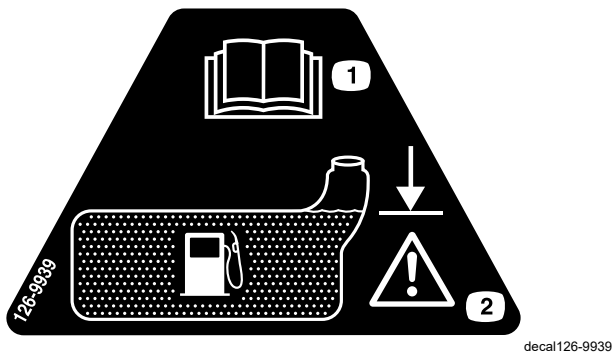
1. Height of cut



126-8161

decal126-8161

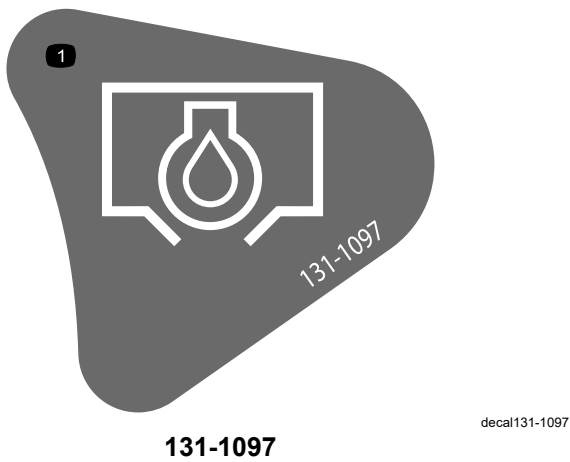
1. Read the *Operator's Manual*.
2. Slide seat forward
3. Press down on latch to unlock seat
4. Rotate seat



**126-9939**

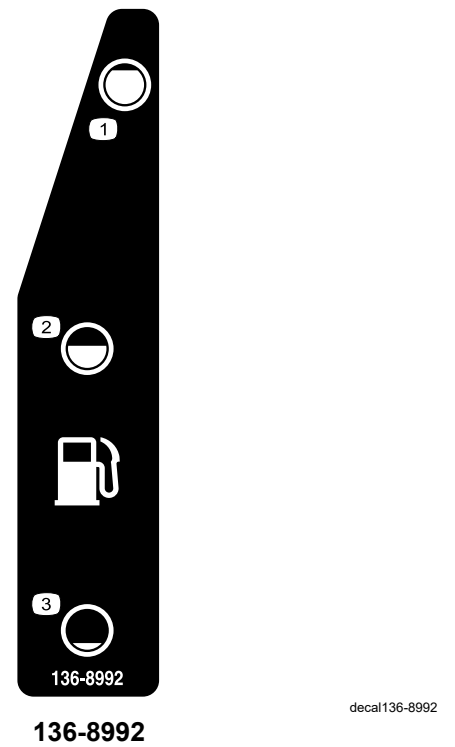
1. Read the Operator's Manual
2. Fill to bottom of filler neck; warning—do not overfill the tank

Decal 131-1097 is for machines with Toro engines only.



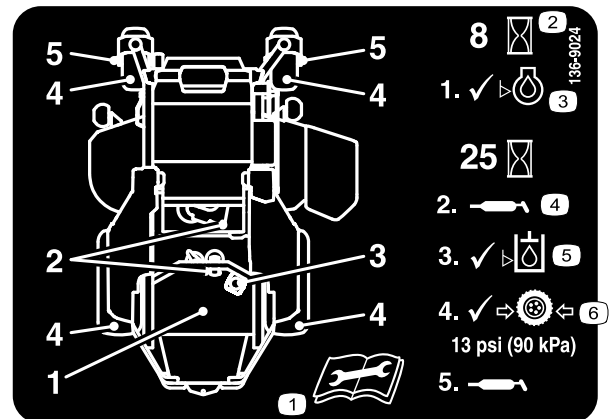
**131-1097**

1. Oil drain



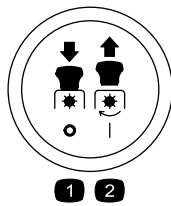
**136-8992**

1. Fuel—full
2. Fuel—50%
3. Fuel—empty



**136-9024**

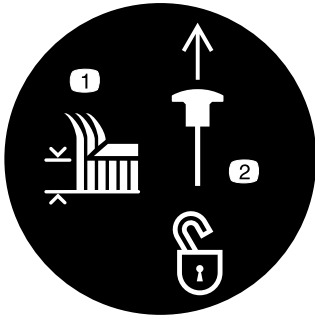
1. Read the *Operator's Manual* before performing maintenance.
2. Operating hours
3. Engine-oil level
4. Grease point
5. Hydraulic-fluid level
6. Tire pressure



### PTO Switch Symbols

decalptosymbols

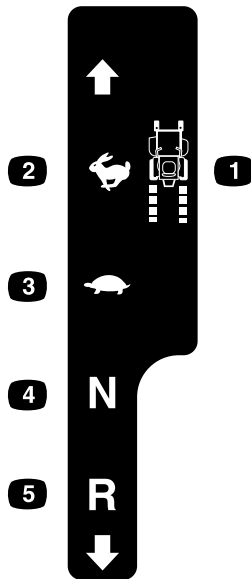
1. PTO-disengage
2. PTO-engage



### Transport Lock

decaltransportlock

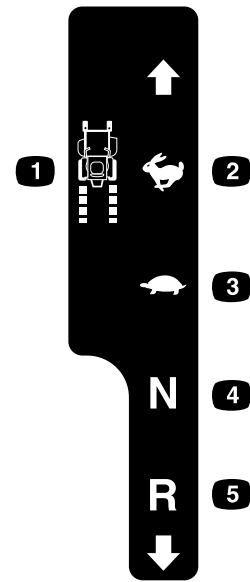
1. Height of cut
2. Pull up to unlock the transport lock.



126-6194

decal126-6194

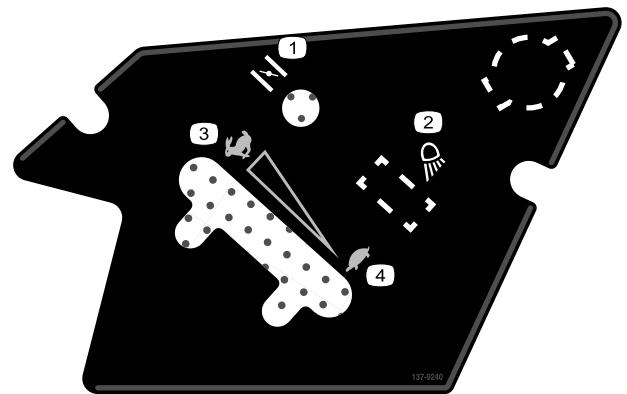
1. Traction control
2. Fast
3. Slow
4. Neutral
5. Reverse



126-6183

decal126-6183

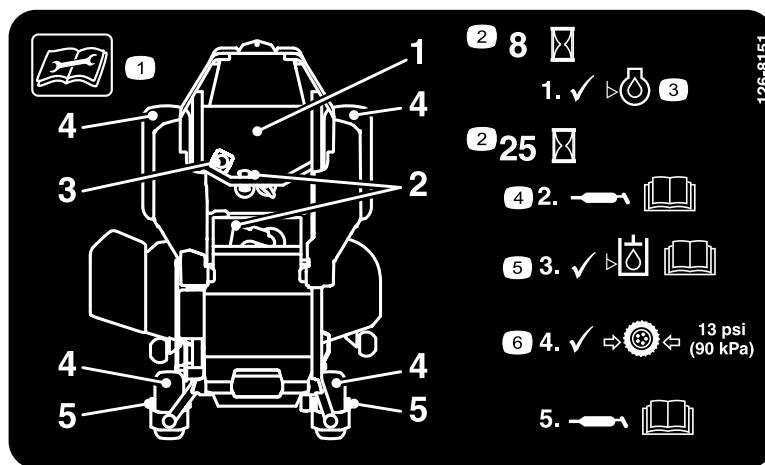
1. Traction control
2. Fast
3. Slow
4. Neutral
5. Reverse



137-9240

decal137-9240

1. Choke
2. Work light
3. Fast
4. Slow

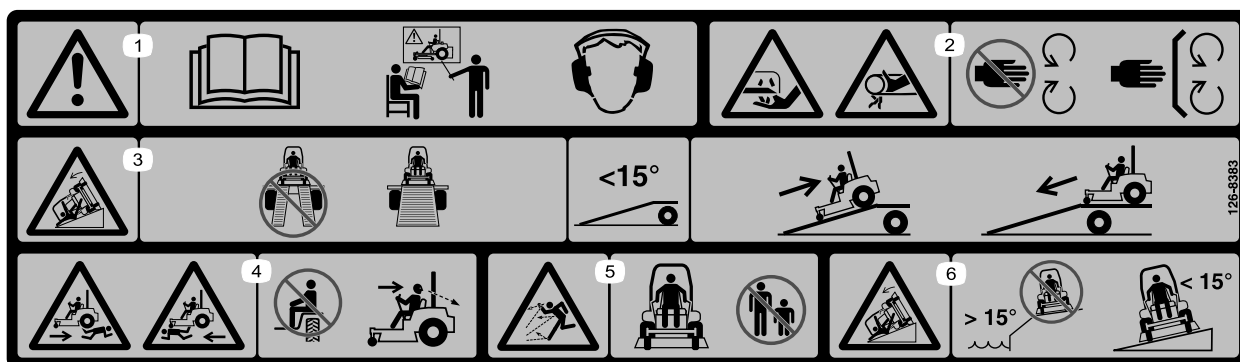


126-8151

decal126-8151

1. Read the instructions before servicing or performing maintenance on the machine.
2. Time interval
3. Check the oil level.
4. Refer to the *Operator's Manual* for grease instructions.
5. Check the hydraulic-fluid level and refer to the *Operator's Manual* for further instructions.
6. Check the tire pressure.

Decal 126-8383 is for machines without MyRide only.



126-8383

decal126-8383

**Note:** This machine complies with the industry standard stability test in the static lateral and longitudinal tests with the maximum recommended slope indicated on the decal. Review the instructions for operating the machine on slopes in the *Operator's Manual* as well as the conditions in which you would operate the machine to determine whether you can operate the machine in the conditions on that day and at that site. Changes in the terrain can result in a change in slope operation for the machine.

1. Warning—read the *Operator's Manual*; do not operate this machine unless you are trained; wear hearing protection.
2. Cutting/dismemberment hazard of the hand, mower blade; entanglement hazard of the hand, belt—stay away from moving parts; keep all guards and shields in place.
3. Ramp hazard—do not use dual ramps when loading onto a trailer; use 1 ramp wide enough for the machine; use a ramp with a slope less than 15°; back up the ramp when loading the machine and drive forward off the ramp when unloading.
4. Runover/backover hazard—do not carry passengers; look behind you when mowing in reverse.
5. Thrown object hazard—keep bystanders away.
6. Tipping hazard—do not use the machine near drop-offs or on slopes greater than 15°; only operate across slopes less than 15°.

Decal 132-0871 is for machines with MyRide only.



132-0871

decal132-0871

**Note:** This machine complies with the industry standard stability test in the static lateral and longitudinal tests with the maximum recommended slope indicated on the decal. Review the instructions for operating the machine on slopes in the *Operator's Manual* as well as the conditions in which you would operate the machine to determine whether you can operate the machine in the conditions on that day and at that site. Changes in the terrain can result in a change in slope operation for the machine.

1. Warning—read the *Operator's Manual*; all operators should be trained before operating the machine; wear hearing protection.
2. Cutting/dismemberment hazard of hand—stay away from moving parts; keep all guards and shields in place.
3. Thrown object hazard—keep bystanders away.
4. Tipping hazard—do not use dual ramps when loading onto a trailer; use 1 ramp wide enough for the machine; use a ramp with a slope less than 15°; back up the ramp (in reverse) and drive forward off the ramp.
5. Runover hazard—do not carry passengers; look behind you when moving in reverse.
6. Tipping hazard—do not use the machine near drop-offs or on slopes greater than 15°; only operate across slopes less than 15°.

Decal 136-1720 is for machines with MyRide only.



136-1720

decal136-1720

1. Cam lock
2. Cam unlock

# Product Overview

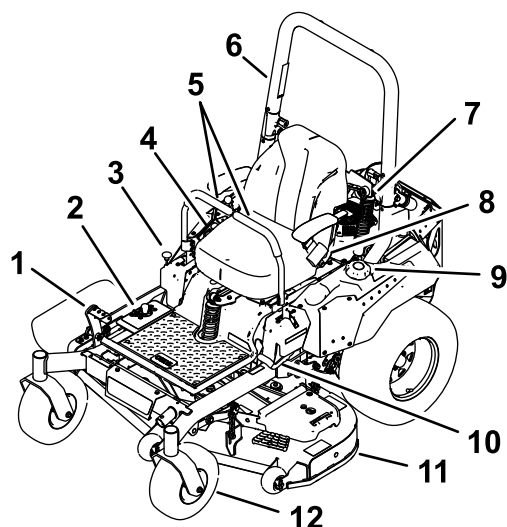


Figure 7

- |                                  |                         |
|----------------------------------|-------------------------|
| 1. Height-of-cut deck-lift pedal | 7. Shock assembly       |
| 2. Height-of-cut positions       | 8. Seat belt            |
| 3. Transport lock                | 9. Fuel cap             |
| 4. Controls                      | 10. Parking-brake lever |
| 5. Motion-control levers         | 11. Mower deck          |
| 6. Roll bar                      | 12. Caster wheel        |

## Controls

Become familiar with all the controls before you start the engine and operate the machine.

### Control Panel

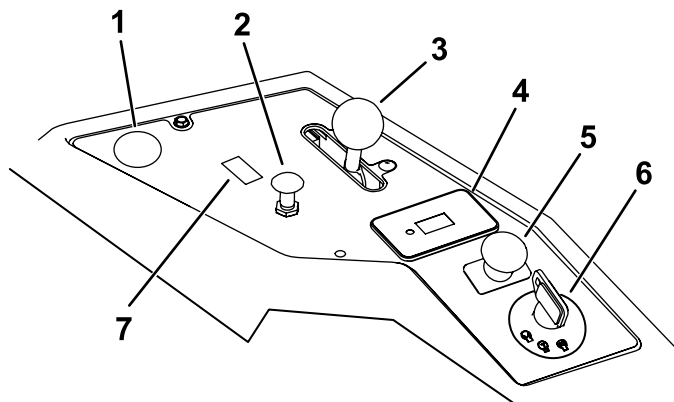


Figure 8

- |                                      |   |
|--------------------------------------|---|
| 1. Position for optional power point | 5. Blade-control switch (power takeoff)                                     |
| 2. Choke control                     | 6. Key switch   |
| 3. Throttle control                  | 7. Light switch (for models with lights only)—optional kit for other models |
| 4. Hour meter                        |   |

### Key Switch

The key switch, used to start and shut off the engine, has 3 positions: OFF, RUN, and START. Refer to [Starting the Engine \(page 28\)](#).

### Light Switch

#### For Models with Lights Only

Use the light switch to turn the lights to the ON position or OFF position ([Figure 8](#)).

### Choke Control

Use the choke control to start a cold engine.

### Throttle Control

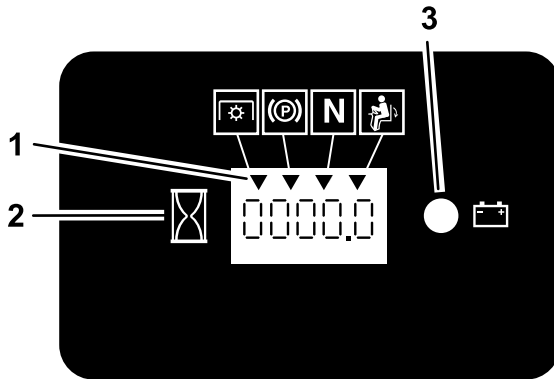
The throttle controls the engine speed, and it has a continuous-variable setting from the SLOW to FAST position ([Figure 8](#)).

### Blade-Control Switch (Power Takeoff)

The blade-control switch, represented by a power-takeoff (PTO) symbol, engages and disengages power to the mower blades ([Figure 8](#)).

## Hour Meter

The hour meter records the number of hours the engine has operated. It operates when the engine is running. Use these times for scheduling regular maintenance ([Figure 9](#)).



g187133

**Figure 9**

- 1. Safety-interlock symbols
- 2. Hour meter
- 3. Battery light

## Safety-Interlock Indicators

There are symbols on the hour meter that indicate with a black triangle that the interlock component is positioned correctly ([Figure 9](#)).

## Battery-Indicator Light

If you turn the key switch to the ON position for a few seconds, the battery voltage displays in the area where the hours are normally displayed.

The battery light turns on when the key switch is turned on and when the charge is below the correct operating level ([Figure 9](#)).

## Motion-Control Levers

Use the motion-control levers to drive the machine forward, reverse, and turn either direction ([Figure 7](#)).

## Neutral-Lock Position

Move the motion-control levers outward from the center to the NEUTRAL-LOCK position when exiting the machine ([Figure 29](#)). Always position the motion-control levers into the NEUTRAL-LOCK position when you stop the machine or leave it unattended.

## Parking-Brake Lever

Whenever you shut off the engine, engage the parking brake to prevent accidental movement of the machine.

## Fuel-Shutoff Valve

Close the fuel-shutoff valve when transporting or storing the machine; refer to [Using the Fuel-Shutoff Valve](#) (page 34).

# Specifications

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

## Width

	<b>48-inch Deck</b>	<b>52-inch Deck</b>	<b>60-inch Deck</b>
Without mower deck	121 cm (47-1/2 inches)	124 cm (49 inches)	133 cm (52 inches)
Deflector up	133 cm (53 inches)	144 cm (56-3/4 inches)	161 cm (63-1/2 inches)
Deflector down	160 cm (63-1/4 inches)	171 cm (67-1/4 inches)	191 cm (75-1/4 inches)

## Length

	<b>48-inch Deck</b>	<b>52-inch Deck</b>	<b>60-inch Deck</b>
Length	208 cm (82 inches)	208 cm (82 inches)	209 cm (83 inches)

## Height

<b>Roll Bar - Up</b>	<b>Roll Bar - Down</b>
179 cm (70-1/2 inches)	125 cm (49 inches)

## Weight

Machines	Weight
<b>48-inch machines</b>	385 to 425 kg (849 to 937 lb)
<b>52-inch machines</b>	391 to 434 kg (862 to 957 lb)
<b>60-inch machines</b>	409 to 456 kg (901 to 1,006 lb)

## Attachments/Accessories

A selection of Toro approved attachments and accessories is available for use with the machine to enhance and expand its capabilities. Contact your Authorized Service Dealer or authorized Toro distributor or go to [www.Toro.com](http://www.Toro.com) for a list of all approved attachments and accessories.

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.



# Operation

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

## *Before Operation*

## Before Operation Safety

### General Safety

- 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 Toro.
- Inspect the area where the equipment is to be used and remove all rocks, toys, sticks, wires, bones, and other foreign objects. These can be thrown or interfere with the operation of the machine and may cause personal injury to the operator or bystanders.
- Wear appropriate personal protective equipment such as safety glasses, substantial slip-resistant footwear, and hearing protection. Tie back long hair and avoid loose clothing and loose jewelry which may get tangled in moving parts.

### **⚠ CAUTION**

**This machine produces sound levels in excess of 85 dBA at the operator's ear and can cause hearing loss through extended periods of exposure.**

**Wear hearing protection when operating this machine.**

- Check that the operator presence controls, safety switches, and shields are attached and functioning properly. Do not operate unless they are functioning properly.
- Do not operate the mower when people, especially children, or pets are in the area. Stop the machine and attachment(s) if anyone enters the area.
- Do not operate the machine without the entire grass collection system, discharge deflector, or other safety devices in place and in proper working condition. Grass catcher components are subject to wear, damage and deterioration, which could expose moving parts or allow objects to be thrown. Frequently check for worn or deteriorating components and replace them with the manufacturer's recommended parts when necessary.

## Fuel Safety

Use extreme care when handling fuel.

### **⚠ DANGER**

**In certain conditions gasoline is extremely flammable and vapors are explosive.**

**A fire or explosion from gasoline can burn you, others, and cause property damage.**

- **Fill the fuel tank outdoors on level ground, in an open area, when the engine is cold. Wipe up any gasoline that spills.**
- **Never refill the fuel tank or drain the machine indoors or inside an enclosed trailer.**
- **Do Not fill the fuel tank completely full. Fill the fuel tank to the bottom of the filler neck. The empty space in the tank allows gasoline to expand. Overfilling may result in fuel leakage or damage to the engine or emission system.**
- **Never smoke when handling gasoline, and stay away from an open flame or where gasoline fumes may be ignited by spark.**
- **Store gasoline in an approved container and keep it out of the reach of children.**
- **Add fuel before starting the engine. Never remove the cap of the fuel tank or add fuel when engine is running or when the engine is hot.**
- **If fuel is spilled, Do Not attempt to start the engine. Move away from the area of the spill and avoid creating any source of ignition until fuel vapors have dissipated.**
- **Do Not operate without entire exhaust system in place and in proper working condition.**

## **⚠ DANGER**

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

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

## **⚠ WARNING**

Gasoline is harmful or fatal if swallowed. Long-term exposure to vapors has caused cancer in laboratory animals. Failure to use caution may cause serious injury or illness.

- Avoid prolonged breathing of vapors.
- Keep face away from nozzle and gas tank/container opening.
- Keep away from eyes and skin.
- Never siphon by mouth.

## **⚠ CAUTION**

Fuel tank vent is located inside the roll bar tube. Removing or modifying the roll bar could result in fuel leakage and violate emissions regulations.

- Do Not remove roll bar.
- Do Not weld, drill, or modify roll bar in any way.

To help prevent fires:

- Keep engine and engine area free from accumulation of grass, leaves, excessive grease or oil, and other debris which can accumulate in these areas.
- Clean up oil and fuel spills and remove fuel soaked debris.
- Allow the machine to cool before storing the machine in any enclosure. Do Not store near flame or any enclosed area where open pilot lights or heat appliances are present.

## **Adding Fuel**

### **Recommended Fuel**

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

## **Using Stabilizer/Conditioner**

Use a fuel stabilizer/conditioner in the machine to provide the following benefits:

- Keeps fuel fresh longer when used as directed by the fuel-stabilizer manufacturer
- Cleans the engine while it runs
- Eliminates gum-like varnish buildup in the fuel system, which causes hard starting

**Important:** Do not use fuel additives containing methanol or ethanol.

Add the correct amount of fuel stabilizer/conditioner to the fuel.

**Note:** A fuel stabilizer/conditioner is most effective when mixed with fresh fuel. To minimize

the chance of varnish deposits in the fuel system, use fuel stabilizer at all times.

## Filling the Fuel Tank

1. Park the machine on a level surface.
2. Engage the parking brake.
3. Shut off the engine and remove the key.
4. Clean around the fuel-tank cap.
5. Fill the fuel tank to the bottom of the filler neck (Figure 10).

**Note:** Do not fill the fuel tank completely full. The empty space in the tank allows the fuel to expand.

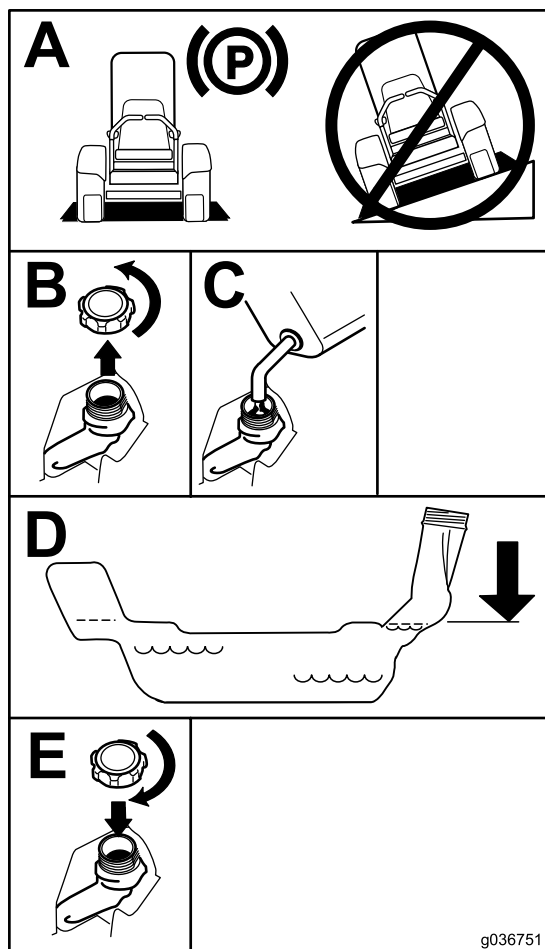


Figure 10

## Performing Daily Maintenance

Before starting the machine each day, perform the Each Use/Daily procedures listed in [Maintenance \(page 37\)](#).

## Breaking in a New Machine

New engines take time to develop full power. Mower decks and drive systems have higher friction when new, placing additional load on the engine. Allow 40 to 50 hours of break-in time for new machines to develop full power and best performance.

## Using the Rollover-Protection System (ROPS)

### ⚠ WARNING

To avoid injury or death from rollover, keep the roll bar in the fully raised, locked position and use the seat belt.

Ensure that the seat is secured to the machine.

### ⚠ WARNING

There is no rollover protection when the roll bar is in the down position.

- Lower the roll bar only when absolutely necessary.
- Do not wear the seat belt when the roll bar is in the down position.
- Drive slowly and carefully.
- Raise the roll bar as soon as clearance permits.
- Check carefully for overhead clearances (i.e., branches, doorways, electrical wires) before driving under any objects and do not contact them.

## Lowering the Roll Bar

**Important:** Lower the roll bar only when absolutely necessary.

1. To lower the roll bar, apply forward pressure to the upper part of the roll bar.
2. Pull both knobs out and rotate them 90 degrees so that they are not engaged (Figure 11).
3. Lower the roll bar to the down position (Figure 11).

# Using the Safety-Interlock System

## ⚠ WARNING

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

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

## Understanding the Safety-Interlock System

The safety-interlock system is designed to prevent the engine from starting unless the following occurs:

- The parking brake is engaged.
- The blade-control switch (PTO) is disengaged.
- The motion-control levers are in the NEUTRAL-LOCK position.

The safety-interlock system also is designed to shut off the engine when the motion-control levers are moved from the NEUTRAL-LOCK position with the parking brake engaged or if you rise from the seat when the PTO is engaged.

The hour meter has indicators to notify the user when the interlock component is in the correct position. When the component is in the correct position, an indicator displays on the screen.

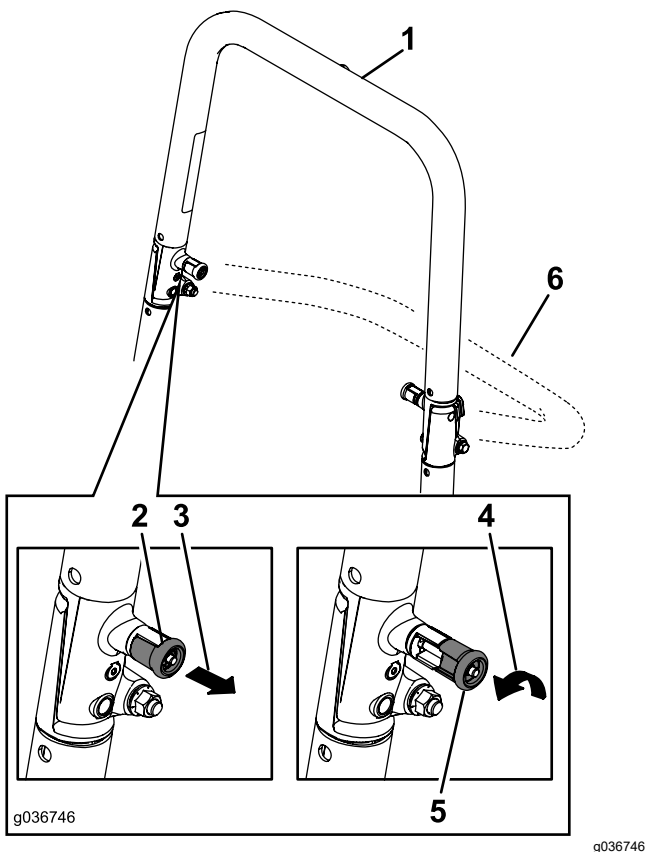


Figure 11

1. Roll bar in the upright position
2. ROPS knob in the latched position
3. Pull the ROPS knob out.
4. Rotate the ROPS knob 90 degrees.
5. ROPS knob in the unlatched position
6. Roll bar in the folded position

## Raising the Roll Bar

**Important:** Always use the seat belt with the roll bar in the raised position.

1. Raise the roll bar to the operating position and rotate the knobs until they move partially into the grooves (Figure 11).
2. Raise the roll bar to the full upright position while pushing on the upper roll bar so that the pins snap into position when the holes align with the pins (Figure 11).
3. Push on the roll bar and ensure that both pins are engaged.

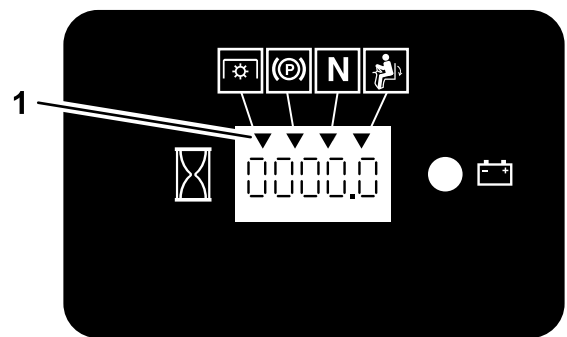


Figure 12

1. Indicators display when the interlock components are in the correct position

## Testing the Safety-Interlock System

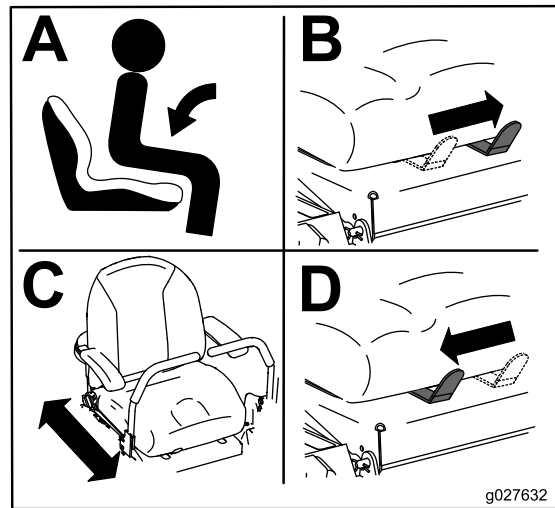
**Service Interval:** Before each use or daily

Test the safety-interlock system before you use the machine each time. If the safety system does not operate as described below, have an Authorized Service Dealer repair the safety system immediately.

1. Sit on the seat, engage the parking brake, and move the blade-control switch (PTO) to the ON position. Try starting the engine; the engine should not start.
2. Sit on the seat, engage the parking brake, and move the blade-control switch (PTO) to the OFF position. Move either motion-control lever out of the NEUTRAL-LOCK position. Try starting the engine; the engine should not start. Repeat for the other control lever.
3. Sit on the seat, engage the parking brake, move the blade-control switch (PTO) to the OFF position, and move the motion-control levers to the NEUTRAL-LOCK position. Now start the engine. While the engine is running, disengage the parking brake, engage the blade-control switch (PTO), and rise slightly from the seat; the engine should shut off.
4. Sit on the seat, engage the parking brake, move the blade-control switch (PTO) to the OFF position, and move the motion-control levers to the NEUTRAL-LOCK position. Now start the engine. While the engine is running, center either motion control and move (forward or reverse); the engine should shut off. Repeat for other motion control.
5. Sit on the seat, disengage the parking brake, move the blade-control switch (PTO) to the OFF position, and move the motion-control levers to the NEUTRAL-LOCK position. Try starting the engine; the engine should not start.

## Positioning the Seat

The seat can move forward and backward ([Figure 13](#)). Position the seat where you have the best control of the machine and are most comfortable.



**Figure 13**

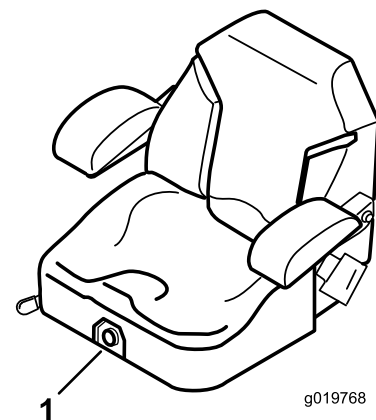
Seat for machines with MyRide shown.

## Changing the Seat Suspension

### Machines without MyRide™ Suspension System Only

The seat is adjustable 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 14](#)).



**Figure 14**

1. Seat-suspension knob

# Adjusting the Rear-Shock Assemblies

## Machines with MyRide™ Suspension System Only

The MyRide™ suspension system adjusts to provide a smooth and comfortable ride. You can adjust the rear 2-shock assemblies to quickly and easily change the suspension system. Position the suspension system where you are most comfortable.

The slots for the rear-shock assemblies have detent positions for reference. You can position the rear-shock assemblies anywhere in the slot, not just in the detent positions. The following graphic shows the position for a soft or firm ride and the different detent positions ([Figure 15](#)).

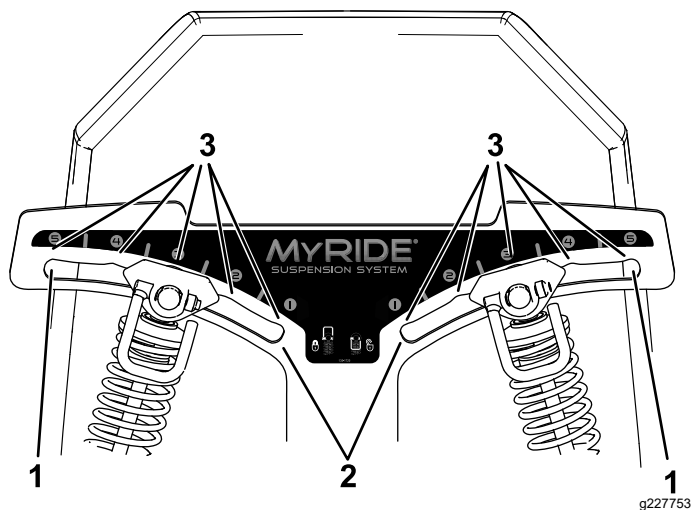


Figure 15

- 1. Firmest position
- 2. Softest position
- 3. Detents in the slots

**Note:** Ensure that the left and right rear-shock assemblies are always adjusted to the same positions.

Adjust the rear-shock assemblies ([Figure 16](#)).

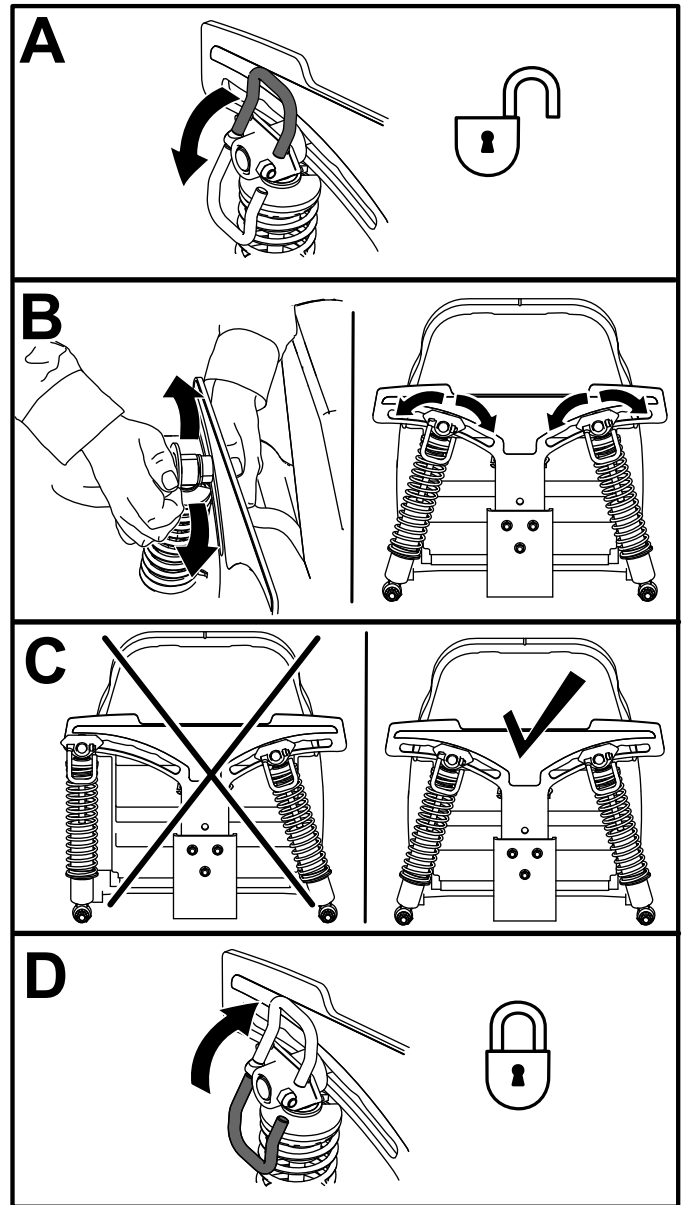
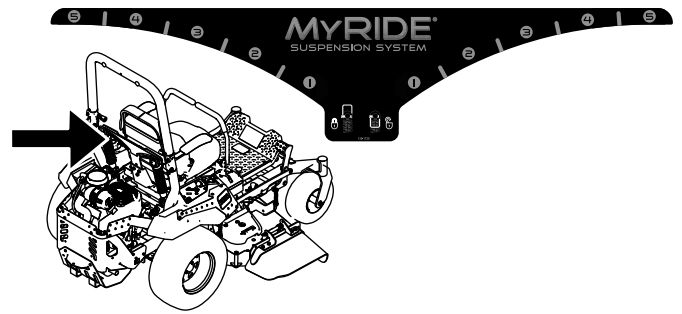


Figure 16

# Using Attachments and Accessories

Use only Toro approved attachments and accessories.

If you add more than 1 accessory mount kit (i.e., bucket kit or universal mount kit) to both of the locations shown in [Figure 17](#), add a front weight kit. Contact an Authorized Service Dealer for the front weight kit.

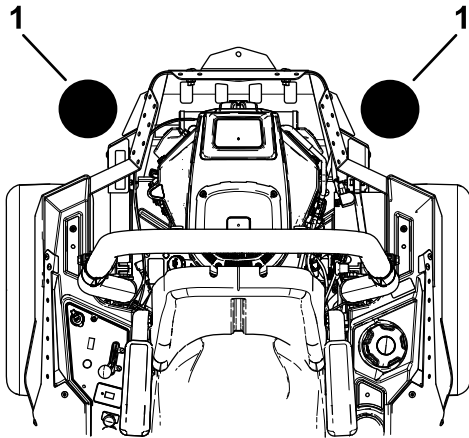


Figure 17

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1. Add a front weight kit when accessory mount kits are installed at both of these positions.

## During Operation

### During Operation Safety

#### General Safety

The operator must use their full attention when operating the machine. **Do Not** engage in any activity that causes distractions; otherwise, injury or property damage may occur.

#### ⚠ WARNING

**Operating engine parts, especially the muffler, become extremely hot. Severe burns can occur on contact and debris, such as leaves, grass, brush, etc. can catch fire.**

- Allow engine parts, especially the muffler, to cool before touching.
- Remove accumulated debris from muffler and engine area.

#### ⚠ WARNING

**Engine exhaust contains carbon monoxide, which is an odorless deadly poison that can kill you.**

**Do Not run engine indoors or in a small confined area where dangerous carbon monoxide fumes can collect.**

- The owner/user can prevent and is responsible for accidents or injuries occurring to himself or herself, other people or property.
- This mower was designed for one operator only. Do not carry passengers and keep all others away from machine during operation.
- Do not operate the machine while ill, tired, or under the influence of alcohol or drugs.
- Operate only in daylight or good artificial light.
- 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 extra care while operating with accessories or attachments, such as grass collection systems. These can change the stability of the machine and cause a loss of control. Follow directions for counter weights if required.
- Keep away from holes, ruts, bumps, rocks, and other hidden hazards. Use care when approaching blind corners, shrubs, trees, tall grass or other objects that may hide obstacles or obscure vision. Uneven terrain could overturn the machine or cause the operator to lose their balance or footing.
- Be sure all drives are in neutral and parking brake is engaged before starting engine. Use seat belts with the roll bar in the raised and locked position.
- Start the engine carefully according to instructions with feet well away from the blades.
- Never operate the mower with damaged guards, shields, or covers. Always have safety shields, guards, switches and other devices in place and in proper working condition.
- Keep clear of the discharge opening at all times. Never mow with the discharge door raised, removed or altered unless there is a grass collection system or mulch kit in place and working properly.
- Keep hands and feet away from moving parts. If possible, Do Not make adjustments with the engine running.



## **⚠ WARNING**

**Hands, feet, hair, clothing, or accessories can become entangled in rotating parts. Contact with the rotating parts can cause traumatic amputation or severe lacerations.**

- **Do Not operate the machine without guards, shields, and safety devices in place and working properly.**
- **Keep hands, feet, hair, jewelry, or clothing away from rotating parts.**
- Never raise the deck with blades running.
- Be aware of the mower discharge path and direct discharge away from others. Avoid discharging material against a wall or obstruction as the material may ricochet back toward the operator. Stop the blades, slow down, and use caution when crossing surfaces other than grass and when transporting the mower to and from the area to be mowed.
- Be alert, slow down and use caution when making turns. Look behind and to the side before changing directions. Do Not mow in reverse unless absolutely necessary.
- Do Not change the engine governor setting or overspeed the engine.
- Park the machine on level ground. Stop engine, wait for all moving parts to stop, and remove the spark plug wire(s).
  - Before checking, cleaning or working on the mower.
  - After striking a foreign object or abnormal vibration occurs (inspect the mower for damage and make repairs before restarting and operating the mower).
  - Before clearing blockages.
  - Whenever you leave the mower. Do Not leave a running machine unattended.
- Stop engine, wait for all moving parts to stop:
  - Before refueling.
  - Before dumping the grass catcher.
  - Before making height adjustments.
- Tragic accidents can occur if the operator is not alert to the presence of children. Children are often attracted to the machine and the mowing activity. Never assume that children will remain where you last saw them.
  - Keep children out of the mowing area and under the watchful care of another responsible adult, not the operator.

- Be alert and turn the machine off if children enter the area.
- Before and while backing or changing direction, look behind, down, and side-to-side for small children.
- Never allow children to operate the machine.
- Do Not carry children, even with the blades shut off. Children could fall off and be seriously injured or interfere with the safe operation of the machine. Children that have been given rides in the past could suddenly appear in the working area for another ride and be run over or backed over by the machine.

## **Slope Safety**

- Slopes are a major factor related to loss of control and rollover accidents, which can result in severe injury or death. The operator is responsible for safe slope operation. Operating the machine on any slope requires extra caution. Before using the machine on a slope, the operator must:
  - Review and understand the slope instructions in the manual and on the machine.
  - Use an angle indicator to determine the approximate slope angle of the area.
  - Never operate on slopes greater than 15 degrees.
  - Evaluate the site conditions of the day to determine if the slope is safe for machine operation. Use common sense and good judgment when performing this evaluation. Changes in the terrain, such as moisture, can quickly affect the operation of the machine on a slope.
- Identify hazards at the base of the slope. Do Not operate the machine near drop offs, ditches, embankments, water or other hazards. The machine could suddenly roll over if a wheel goes over the edge or the edge collapses. Keep a safe distance (twice the width of the machine) between the machine and any hazard. Use a walk behind machine or a hand trimmer to mow the grass in these areas.



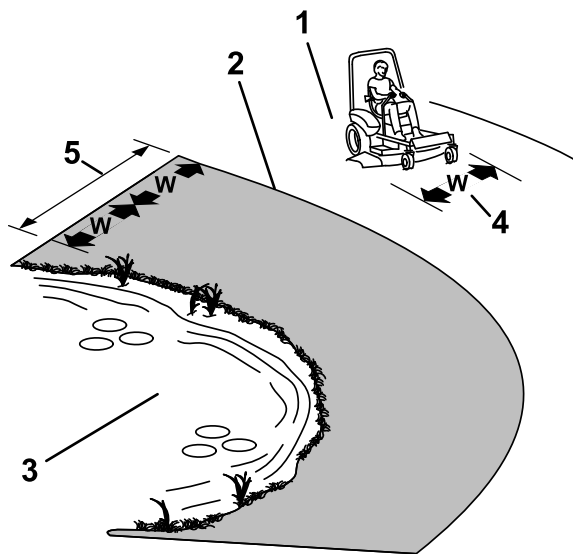


Figure 18

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1. Safe Zone-Use the mower here on slopes less than 15 degrees
2. Danger Zone-Use a walk-behind mower and/or hand trimmer on slopes greater than 15 degrees
3. Water
4. W=width of the machine
5. Keep a safe distance (twice the width of the machine) between the machine and any hazard.

## Rollover Protection System (ROPS) Safety

A Rollover Protection System (roll bar) is installed on the machine.

### ⚠ WARNING

There is no rollover protection when the roll bar is down. Wheels dropping over edges, ditches, steep banks, or water can cause rollovers, which may result in serious injury, death or drowning.

- Do Not remove the ROPS.
- Keep the roll bar in the raised and locked position and use seat belt.
- Lower the roll bar only when absolutely necessary.
- Do Not wear seat belt when the roll bar is down.
- Drive slowly and carefully.
- Raise the roll bar as soon as clearance permits.
- Be certain that the seat belt can be released quickly in the event of an emergency.
- Check carefully for overhead clearances (i.e. branches, doorways, and electrical wires) before driving under any objects and Do Not contact them.
- In the event of a rollover, take the unit to an Authorized Service Dealer to have the ROPS inspected.
- Replace a damaged ROPS. Do Not repair or revise.
- Any accessories, alterations, or attachments added to the ROPS must be approved by Toro.

- Avoid starting, stopping or turning the machine on slopes. Avoid making sudden changes in speed or direction; turn slowly and gradually.
- Do Not operate a machine under any conditions where traction, steering or stability is in question. Be aware that operating the machine on wet grass, across slopes or downhill may cause the machine to lose traction. Loss of traction to the drive wheels may result in sliding and a loss of braking and steering. The machine can slide even if the drive wheels are stopped.
- Remove or mark obstacles such as ditches, holes, ruts, bumps, rocks or other hidden hazards. Tall grass can hide obstacles. Uneven terrain could overturn the machine.
- Use extra care while operating with accessories or attachments, such as grass collection systems. These can change the stability of the machine and cause a loss of control. Follow directions for counter weights.
- If possible, keep the deck lowered to the ground while operating on slopes. Raising the deck while operating on slopes can cause the machine to become unstable.

# Entering the Operator's Position

Use the mower deck as a step to get into the operator's position (Figure 19).

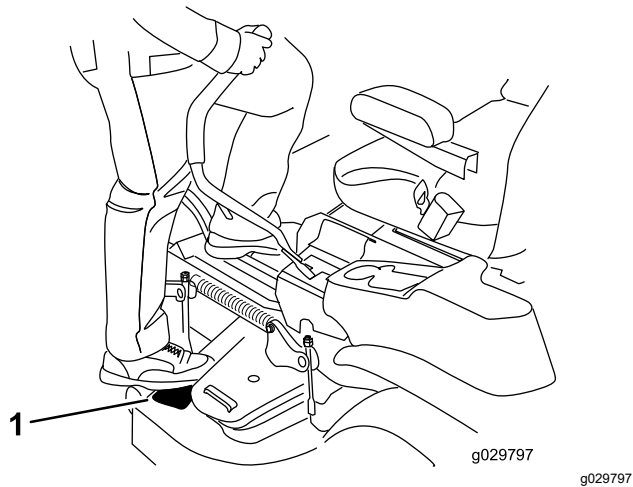


Figure 19

- 1. Step here.

# Disengaging the Parking Brake

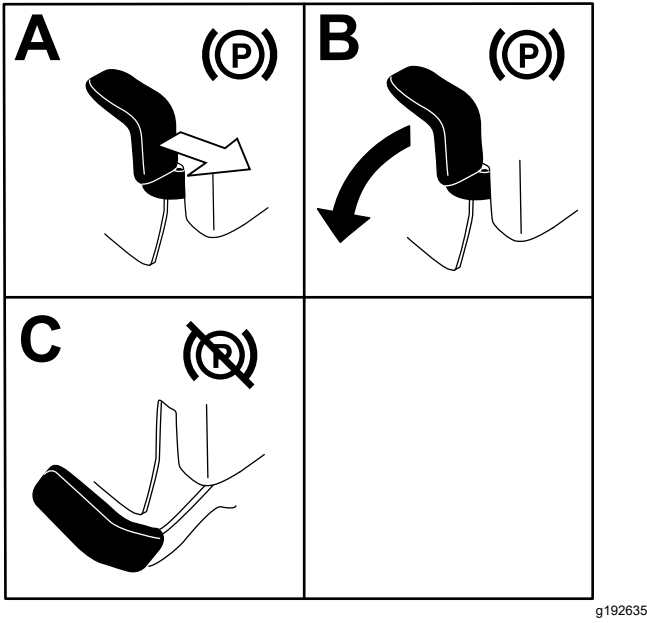


Figure 21

# Operating the Parking Brake

Always engage the parking brake when you stop the machine or leave it unattended.

## Engaging the Parking Brake

Park the machine on a level surface.

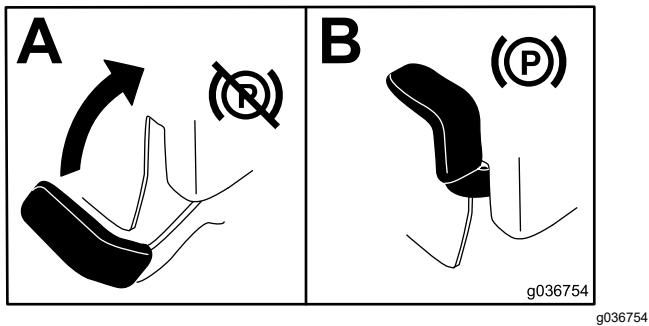


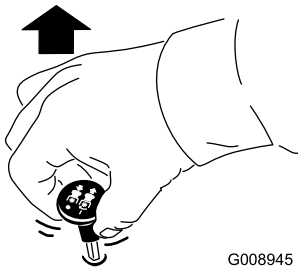
Figure 20

## Operating the Mower Blade-Control Switch (PTO)

The blade-control switch (PTO) starts and stops the mower blades and any powered attachments.

### Engaging the Blade-Control Switch (PTO)

**Note:** Engaging the blade-control switch (PTO) with the throttle position at half or less causes excessive wear to the drive belts.

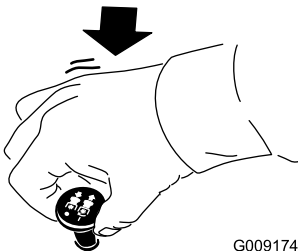


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Figure 22

### Disengaging the Blade-Control Switch (PTO)



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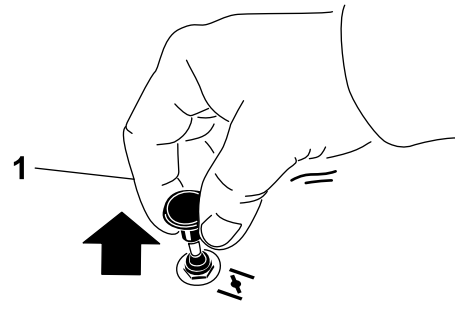
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Figure 23

## Operating the Choke

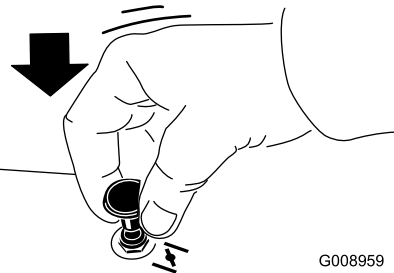
Use the choke to start a cold engine.

1. Pull up the choke knob to engage the choke before using the key switch (Figure 25).
2. Push down the choke knob to disengage the choke after the engine has started (Figure 25).



1

2



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Figure 25

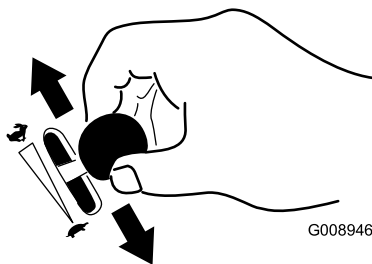
1. ON position

2. OFF position

## Operating the Throttle

You can move the throttle control between FAST and SLOW positions (Figure 24).

Always use the FAST position when engaging the PTO.



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g008946

Figure 24

## Starting the Engine

**Note:** A warm or hot engine may not require choking.

**Important:** Do not engage the starter for more than 5 seconds at a time. Engaging the starter motor for more than 5 seconds can damage the starter motor. If the engine fails to start, wait 10 seconds before operating the engine starter again.

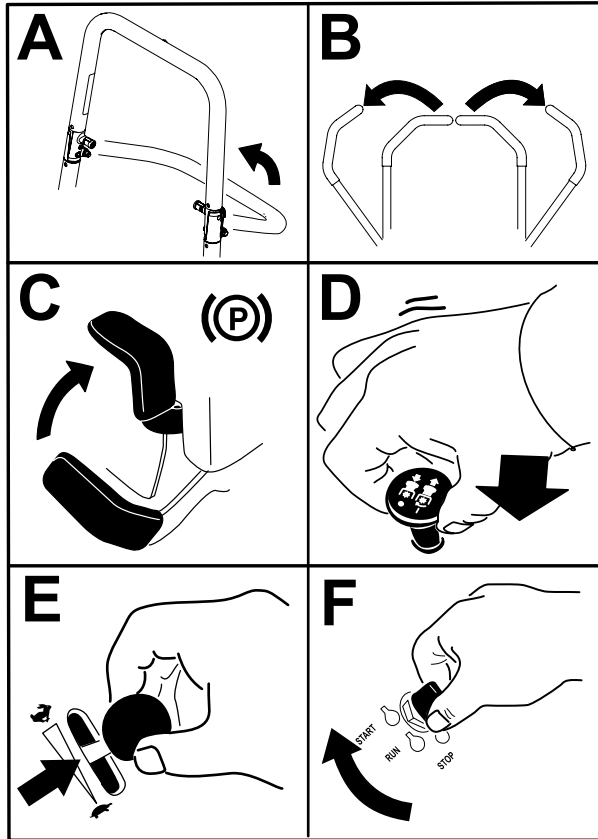


Figure 26

g227548

## Shutting Off the Engine

**Note:** Refer to Figure 42 to determine which engine you have.

### ⚠ CAUTION

Children or bystanders may be injured if they move or attempt to operate the machine while it is unattended.

Always remove the key and engage the parking brake when leaving the machine unattended.

## Shutting Off Kawasaki Engines

Let the engine idle at slow throttle for 60 seconds before turning the switch off.

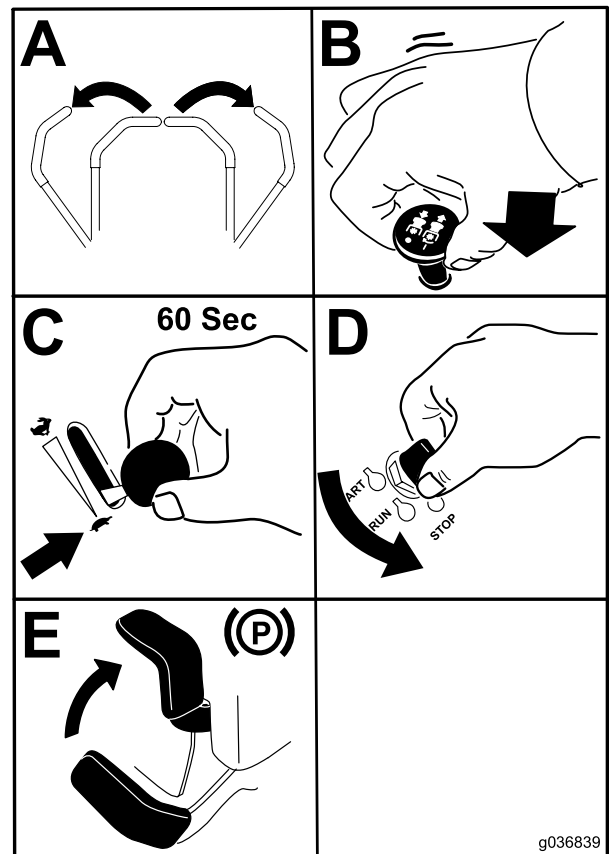


Figure 27

g036839

g036839

**Important:** Make sure that the fuel-shutoff valve is closed before transporting or storing the machine to prevent fuel leakage. Engage the parking brake before transporting. Remove the key as the fuel pump may run and cause the battery to lose charge.

## Shutting Off Toro Engines

**Note:** Ensure the throttle is in the FAST position before shutting off the engine.

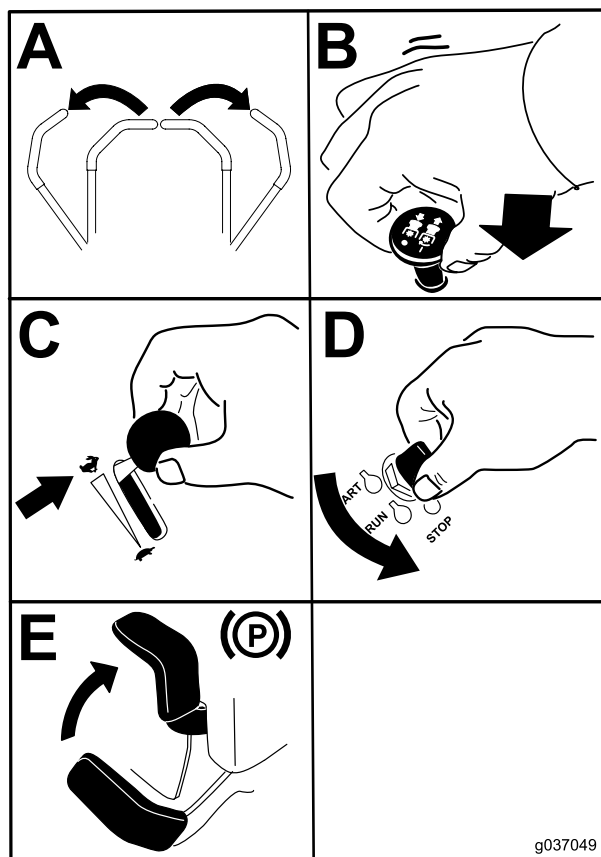


Figure 28

**Important:** Make sure that the fuel-shutoff valve is closed before transporting or storing the machine to prevent fuel leakage. Engage the parking brake before transporting. Remove the key as the fuel pump may run and cause the battery to lose charge.

## Using the Motion-Control Levers

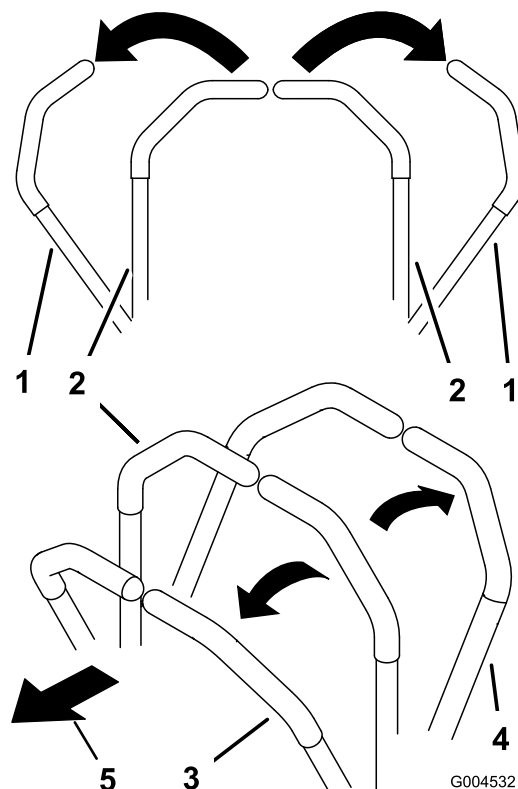


Figure 29

1. Motion-control lever—NEUTRAL-LOCK position
2. Center, unlocked position
3. Forward
4. Backward
5. Front of machine

# Driving the Machine

The drive wheels turn independently, powered by hydraulic motors on each axle. You can turn 1 side in reverse while you turn the other forward, causing the machine to spin rather than turn. This greatly improves the machine maneuverability but may require some time for you to adapt to how it moves.

The throttle control regulates the engine speed as measured in rpm (revolutions per minute). Place the throttle control in the FAST position for best performance. Always operate in the full throttle position when mowing.

## ⚠ WARNING

**The machine can spin very rapidly. You may lose control of the machine and cause personal injury or damage to the machine.**

- Use caution when making turns.
- Slow the machine down before making sharp turns.

## Driving Forward

**Note:** The engine shuts off when you move the traction-control with the parking brake engaged.

To stop the machine, pull the motion-control levers to the NEUTRAL position.

1. Disengage the parking brake; refer to [Disengaging the Parking Brake \(page 26\)](#).
2. Move the levers to the center, unlocked position.
3. To go forward, slowly push the motion-control levers forward ([Figure 30](#)).

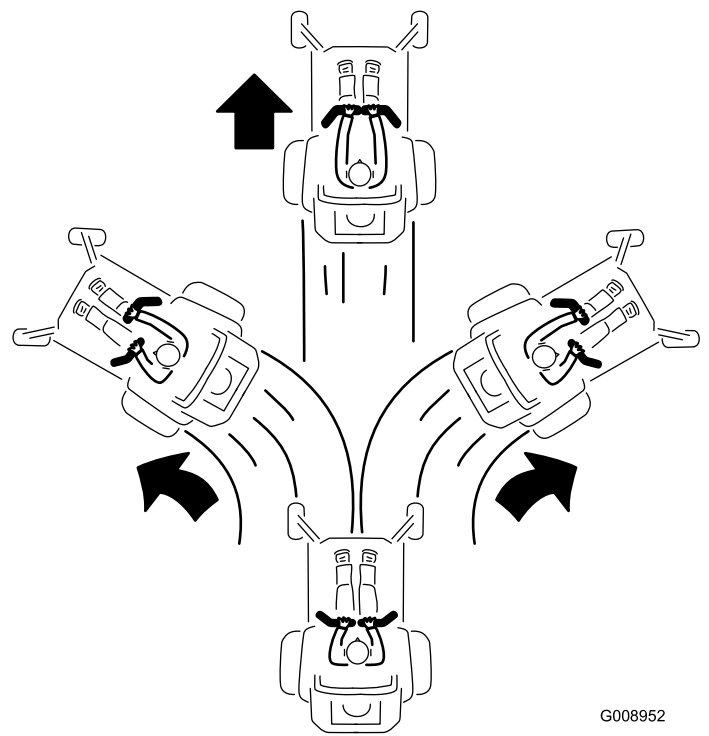


Figure 30

G008952  
g008952

## Driving Backward

1. Move the levers to the center, unlocked position.
2. To go backward, slowly pull the motion-control levers rearward ([Figure 31](#)).

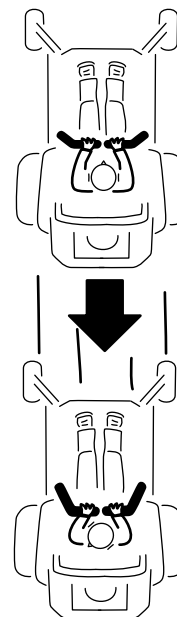


Figure 31

G008953  
g008953

# Using the Side Discharge

The mower has a hinged grass deflector that disperses clippings to the side and down toward the turf.

## ⚠ DANGER

Without a grass deflector, discharge cover, or a complete grass-catcher assembly mounted in place, you and others are exposed to blade contact and thrown debris. Contact with rotating mower blade(s) and thrown debris will cause injury or death.

- Never remove the grass deflector from the mower deck because the grass deflector routes material down toward the turf. If the grass deflector is ever damaged, replace it immediately.
- Never put your hands or feet under the mower deck.
- Never try to clear the discharge area or mower blades unless you move the blade-control switch (PTO) to the OFF position, rotate the key switch to the OFF position, and remove the key from the key switch.
- Make sure that the grass deflector is in the down position.

# Adjusting the Height of Cut

## Using the Transport Lock

The transport lock has 2 positions, and is used with the deck-lift pedal. There is a LOCK position and an UNLOCK position for the transport position of the mower deck (Figure 32).

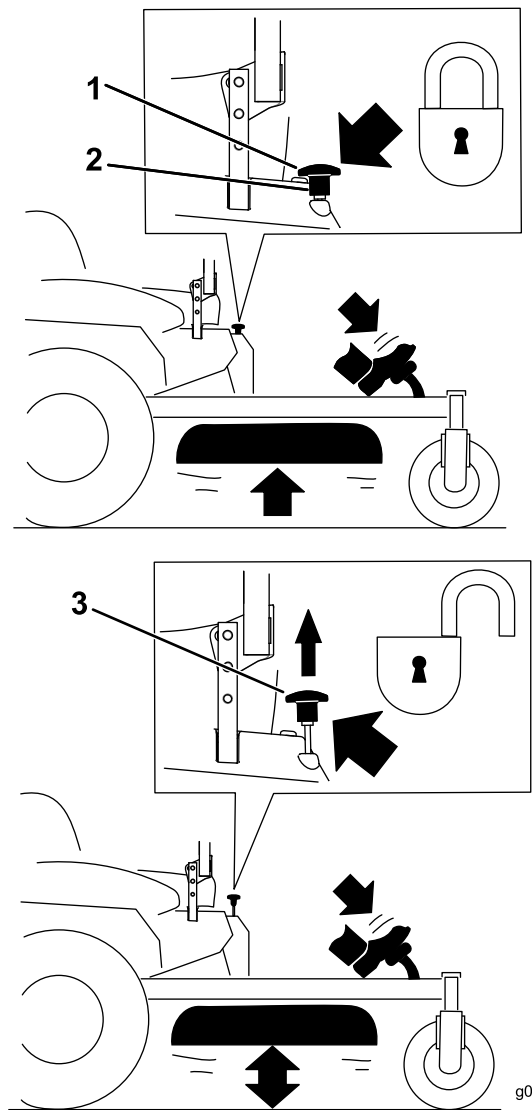


Figure 32

Transport-Lock Positions

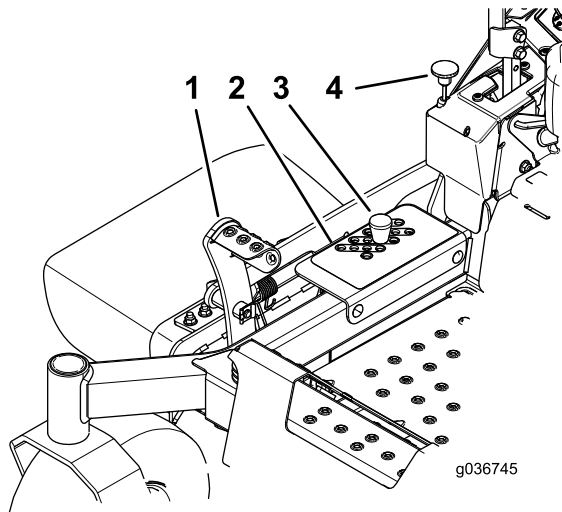
1. Transport lock knob
2. LOCK position—The mower deck locks into the transport position.
3. UNLOCK position—The mower deck does not lock into the transport position.

## Adjusting the Height-of-Cut Pin

Adjust the height-of-cut from 38 to 127 mm (1-1/2 to 5 inches) in 6 mm (1/4 inch) increments by moving the height-of-cut pin into different hole locations.

1. Move the transport lock to the LOCK position.
2. Push on the deck-lift pedal with your foot and raise the mower deck to the TRANSPORT position (also the 127 mm or 5 inch cutting-height position) as shown in Figure 33.
3. Remove the pin from the height-of-cut bracket (Figure 33).

4. Select a hole in the height-of-cut bracket corresponding to the height-of-cut desired, and insert the pin (Figure 33).
5. Push on the deck lift, pull up on the transport lock knob, and slowly lower the mower deck.



**Figure 33**

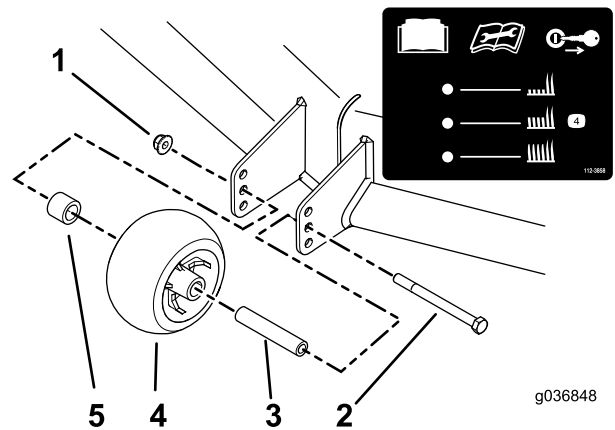
- |                        |                        |
|------------------------|------------------------|
| 1. Deck-lift pedal     | 3. Height-of-cut pin   |
| 2. Height-of-cut holes | 4. Transport lock knob |

## Adjusting the Anti-Scalp Rollers

Whenever you change the height of cut, adjust the height of the anti-scalp rollers.

**Note:** Adjust the anti-scalp rollers so that the rollers do not touch the ground in normal, flat mowing areas.

1. Park the machine on a level surface, disengage the blade-control switch and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Adjust the anti-scalp rollers as shown in Figure 34.



**Figure 34**

- |               |                      |
|---------------|----------------------|
| 1. Flange nut | 4. Anti-scalp roller |
| 2. Bolt       | 5. Spacer            |
| 3. Bushing    |                      |



# Operating Tips

## Using the Fast Throttle Setting

For best mowing and maximum air circulation, operate the engine at the FAST position. Air is required to thoroughly cut grass clippings, so do not set the height-of-cut so low as to totally surround the mower deck in uncut grass. Always try to have 1 side of the mower deck free from uncut grass, which allows air to be drawn into the mower deck.

## Cutting a Lawn for the First Time

Cut grass slightly longer than normal to ensure that the cutting height of the mower deck does not scalp any uneven ground. However, the cutting height used in the past is generally the best one to use. When cutting grass longer than 15 cm (6 inches) tall, you may want to cut the lawn twice to ensure an acceptable quality of cut.

## Cutting a Third of the Grass Blade

It is best to cut only about a third of the grass blade. Cutting more than that is not recommended unless grass is sparse, or it is late fall when grass grows more slowly.

## Alternating the Mowing Direction

Alternate the mowing direction to keep the grass standing straight. This also helps disperse clippings, which enhances decomposition and fertilization.

## Mowing at Correct Intervals

Grass grows at different rates at different times of the year. To maintain the same cutting height, mow more often in early spring. As the grass growth rate slows in mid summer, mow less frequently. If you cannot mow for an extended period, first mow at a high cutting height, then mow again 2 days later at a lower height setting.

## Using a Slower Cutting Speed

To improve cut quality, use a slower ground speed in certain conditions.

## Avoiding Cutting Too Low

When mowing uneven turf, raise the cutting height to avoid scalping the turf.

## Stopping the Machine

If you must stop the forward motion of the machine while mowing, a clump of grass clippings may

drop onto your lawn. To avoid this, move onto a previously cut area with the blades engaged or you can disengage the mower deck while moving forward.

## Keeping the Underside of the Mower Deck Clean

Clean clippings and dirt from the underside of the mower deck after each use. If grass and dirt build up inside the mower deck, cutting quality will eventually become unsatisfactory.

## Maintaining the Blade(s)

Maintain a sharp blade throughout the cutting season because a sharp blade cuts cleanly without tearing or shredding the grass blades. Tearing and shredding turns grass brown at the edges, which slows growth and increases the chance of disease. Check the mower blades after each use for sharpness, and for any wear or damage. File down any nicks and sharpen the blades as necessary. If a blade is damaged or worn, replace it immediately with a genuine Toro replacement blade.

## After Operation

### After Operation Safety

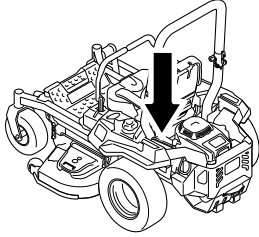
#### General Safety

- Park machine on level ground, disengage drives, set parking brake, stop engine, remove key or disconnect spark plug wire. Wait for all movement to stop and allow the machine to cool before adjusting, cleaning, repairing, or storing. Never allow untrained personnel to service machine.
- Clean the machine as stated in the Maintenance section. Keep engine and engine area free from accumulation of grass, leaves, excessive grease or oil, and other debris which can accumulate in these areas. These materials can become combustible and may result in a fire.
- Frequently check for worn or deteriorating components that could create a hazard. Tighten loose hardware.

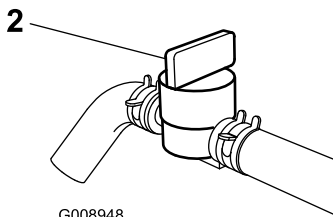
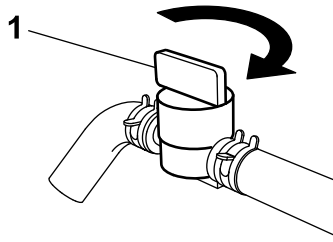
# Using the Fuel-Shutoff Valve

Close the fuel-shutoff valve for transport, maintenance, and storage (Figure 35).

Ensure that the fuel-shutoff valve is open when starting the engine.



g036849



G008948

**Figure 35**

1. ON position

2. OFF position

# Using the Drive-Wheel Release Valves

## ⚠ WARNING

Hands may become entangled in the rotating drive components below the engine deck, which could result in serious injury.

Shut off the engine, remove the key, and allow all moving parts to stop before accessing the drive-wheel release valves.

## ⚠ WARNING

The engine and hydraulic-drive units can become very hot. Touching a hot engine or hydraulic-drive units can cause severe burns.

Allow the engine and hydraulic-drive units to cool completely before accessing the drive-wheel release valves.

The drive-wheel release valves are located on the left and right sides underneath the engine deck.

1. Park the machine on a level surface, disengage the blade-control switch, and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Locate the bypass levers behind the seat, down on the left and right side of the frame.
4. To push the machine, move both bypass knobs rearward and lock them into place (Figure 36).
5. Disengage the parking brake before pushing the machine.

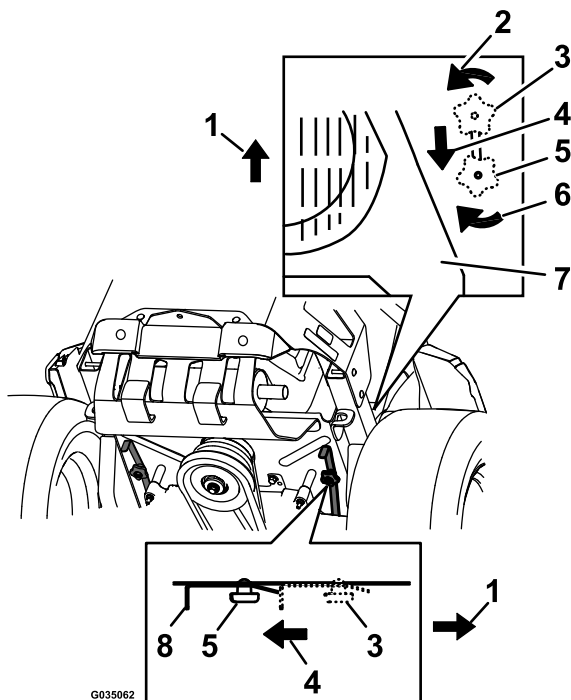


Figure 36

1. Front of the machine
  2. Rotate bypass release knob counterclockwise to loosen.
  3. Lever position for operating the machine
  4. Pull the lever in this direction to push the machine.
  5. Lever position for pushing the machine
  6. Rotate the bypass-release knob clockwise to tighten.
  7. Engine
  8. Release lever
- 
6. To run the machine, move the bypass knobs to the FORWARD position and lock them into place (Figure 36).

## Transporting the Machine

Use a heavy-duty trailer or truck to transport the machine. Use a full-width ramp. Ensure that the trailer or truck has all the necessary brakes, lighting, and marking as required by law. Please carefully read all the safety instructions. Knowing this information could help you or bystanders avoid injury. Refer to your local ordinances for trailer and tie-down requirements.

### ⚠ WARNING

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

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

## Selecting a Trailer

### ⚠ WARNING

Loading a machine onto a trailer or truck increases the possibility of tip-over and could cause serious injury or death (Figure 37).

- Use only a full-width ramp; do not use individual ramps for each side of the machine.
- Do not exceed a 15-degree angle between the ramp and the ground or between the ramp and the trailer or truck.
- Ensure that the length of the ramp is at least 4 times as long as the height of the trailer or truck bed to the ground. This ensures that the ramp angle does not exceed 15 degrees on flat ground.

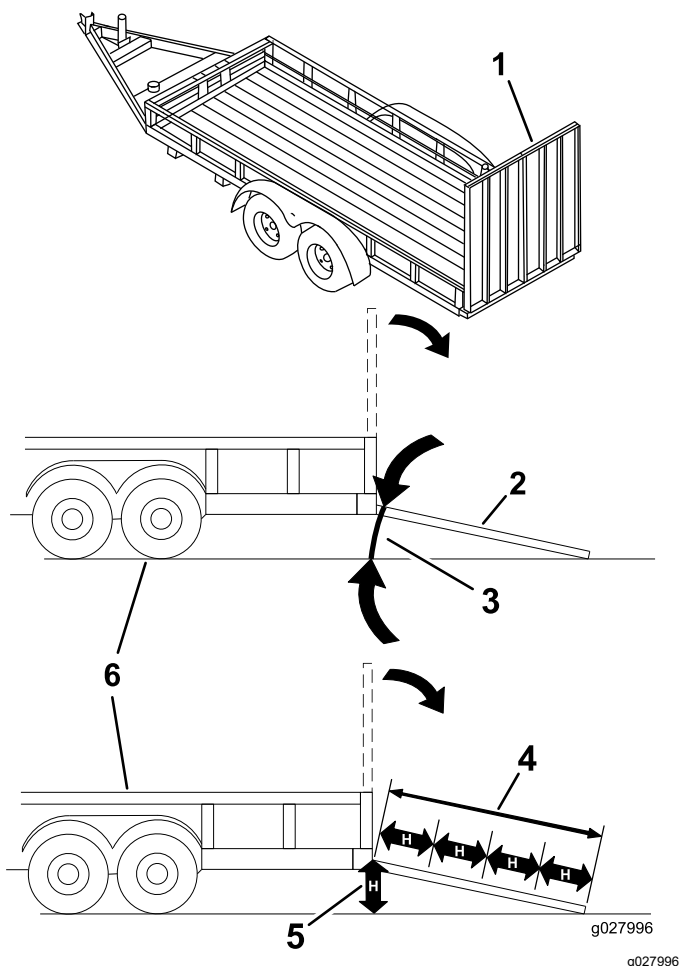


Figure 37

- |   |   |
|---|---|
| 1. Full-width ramp in stowed position               | 4. Ramp is at least 4 times as long as the height of the trailer or truck bed to the ground |
| 2. Side view of full-width ramp in loading position | 5. H=height of the trailer or truck bed to the ground                                       |
| 3. Not greater than 15 degrees                      | 6. Trailer  |

## Loading the Machine

### ⚠ WARNING

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

- Use extreme caution when operating a machine on a ramp.
- Back the machine up the ramp and drive it forward down the ramp.
- Avoid sudden acceleration or deceleration while driving the machine on a ramp as this could cause a loss of control or a tip-over situation.

1. If using a trailer, connect it to the towing vehicle and connect the safety chains.
2. If applicable, connect the trailer brakes and lights.
3. Lower the ramp, ensuring that the angle between the ramp and the ground does not exceed 15 degrees (Figure 37).
4. Back the machine up the ramp (Figure 38).

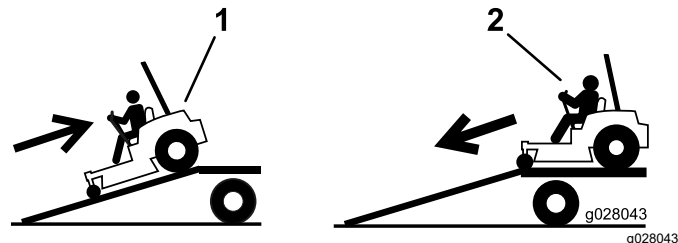


Figure 38

1. Back the machine up the ramp.
2. Drive the machine forward down the ramp.

5. Shut off the engine, remove the key, and engage the parking brake.
6. Tie down the machine near the front caster wheels and the rear bumper with straps, chains, cable, or ropes (Figure 39). Refer to local regulations for tie-down requirements.

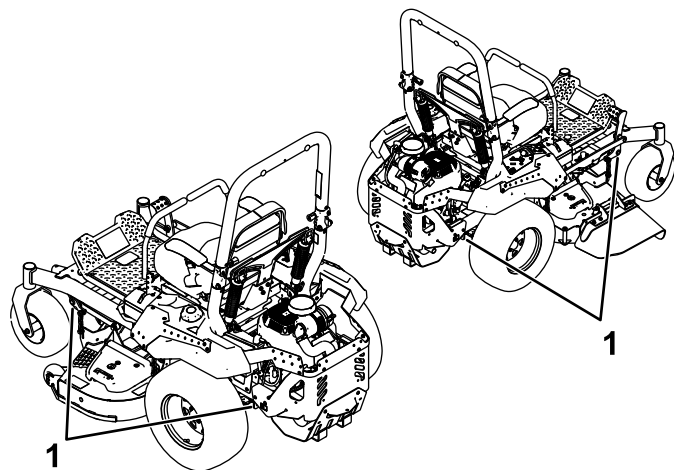


Figure 39

1. Tie-down loops

## Unloading the Machine

1. Lower the ramp, ensuring that the angle between the ramp and the ground does not exceed 15 degrees (Figure 37).
2. Drive the machine forward down the ramp (Figure 38).

# Maintenance

## Maintenance Safety

### **⚠ WARNING**

While maintenance or adjustments are being made, someone could start the engine. Accidental starting of the engine could seriously injure you or other bystanders.

Remove the key from the ignition switch, engage parking brake, and pull the wire(s) off the spark plug(s) before you do any maintenance. Also push the wire(s) aside so it does not accidentally contact the spark plug(s).

### **⚠ WARNING**

The engine can become very hot. Touching a hot engine can cause severe burns.

Allow the engine to cool completely before service or making repairs around the engine area.

- Park machine on level ground, disengage drives, set parking brake, stop engine, remove key or disconnect spark plug wire. Wait for all movement to stop and allow the machine to cool before adjusting, cleaning or repairing. Never allow untrained personnel to service machine.
- Disconnect battery or remove spark plug wire before making any repairs. Disconnect the negative terminal first and the positive last. Reconnect positive first and negative last.
- Keep the machine, guards, shields and all safety devices in place and in safe working condition. Frequently check for worn or deteriorating components and replace them with the manufacturer's recommended parts when necessary.

### **⚠ WARNING**

Removal or modification of original equipment, parts and/or accessories may alter the warranty, controllability, and safety of the machine. Unauthorized modifications to the original equipment or failure to use original Toro parts could lead to serious injury or death. Unauthorized changes to the machine, engine, fuel or venting system, may violate applicable safety standards such as: ANSI, OSHA and NFPA and/or government regulations such as EPA and CARB.

### **⚠ WARNING**

Hydraulic fluid escaping under pressure can penetrate skin and cause injury. Fluid accidentally injected into the skin must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result.

- If equipped, make sure all hydraulic fluid hoses and lines are in good condition and all hydraulic connections and fittings are tight before applying pressure to hydraulic system.
- Keep body and hands away from pinhole leaks or nozzles that eject high pressure hydraulic fluid.
- Use cardboard or paper, not your hands, to find hydraulic leaks.
- Safely relieve all pressure in the hydraulic system by placing the motion control levers in neutral and shutting off the engine before performing any work on the hydraulic system.

### **⚠ WARNING**

Fuel system components are under high pressure. The use of improper components can result in system failure, gasoline leakage and possible explosion.

Use only approved fuel lines and fuel filters for high pressure systems.

- Use care when checking blades. Wrap the blade(s) or wear gloves, and use caution when servicing them. Only replace damaged blades. Never straighten or weld them.

- Use jack stands to support the machine and/or components when required.

### ⚠ CAUTION

**Raising the machine for service or maintenance relying solely on mechanical or hydraulic jacks could be dangerous. The mechanical or hydraulic jacks may not be enough support or may malfunction allowing the machine to fall, which could cause injury.**

**Do not rely solely on mechanical or hydraulic jacks for support. Use adequate jack stands or equivalent support.**

- Carefully release pressure from components with stored energy.

- Keep hands and feet away from moving parts. If possible, Do Not make adjustments with the engine running. If the maintenance or adjustment procedure require the engine to be running and components moving, use extreme caution.

### ⚠ WARNING

**Contact with moving parts or hot surfaces may cause personal injury.**

**Keep your fingers, hands, and clothing clear of rotating components and hot surfaces.**

- Check all bolts frequently to maintain proper tightness.

## Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first 5 hours	<ul style="list-style-type: none"> <li>• For Toro engines—change the engine oil and filter.</li> </ul>
After the first 75 hours	<ul style="list-style-type: none"> <li>• Change the hydraulic-system filters and fluid.</li> </ul>
Before each use or daily	<ul style="list-style-type: none"> <li>• Check the safety-interlock system.</li> <li>• For Kawasaki engines—check the engine-oil level.</li> <li>• For Toro engines—check the engine-oil level.</li> <li>• Clean the blower housing (more often under dusty, dirty conditions).</li> <li>• Clean the air intake screen.</li> <li>• Check the seat belt.</li> <li>• Check the roll bar knobs.</li> <li>• Clean the engine screen and the area around the engine.</li> <li>• Clean around the engine-exhaust system.</li> <li>• Check the hydraulic fluid level in the expansion tank.</li> <li>• Inspect the blades.</li> <li>• Clean the mower deck.</li> <li>• Clean the suspension system.</li> </ul>
Every 25 hours	<ul style="list-style-type: none"> <li>• Grease the front caster axles (more often in dirty or dusty conditions).</li> </ul>
Every 50 hours	<ul style="list-style-type: none"> <li>• Grease the pump-idler pivot.</li> <li>• Check the spark arrester (if equipped).</li> <li>• Check the tire pressure.</li> <li>• Inspect the belts for cracks and wear.</li> </ul>
Every 100 hours	<ul style="list-style-type: none"> <li>• For Kawasaki engines—change the engine oil (more often in dirty or dusty conditions).</li> <li>• For Kawasaki engines—replace or clean and gap the spark plug.</li> </ul>
Every 100 hours or yearly, whichever comes first	<ul style="list-style-type: none"> <li>• For Toro engines—change the engine oil and oil filter (more often in dirty or dusty conditions).</li> <li>• For Toro engines—check the spark plug(s).</li> </ul>
Every 200 hours	<ul style="list-style-type: none"> <li>• For Kawasaki engines—change the engine-oil filter (more often in dirty or dusty conditions).</li> <li>• For Toro engines—replace the spark plug(s).</li> </ul>

Maintenance Service Interval	Maintenance Procedure
Every 250 hours	<ul style="list-style-type: none"> <li>For Kawasaki engines—replace the primary air filter (more often in dirty or dusty conditions).</li> <li>For Kawasaki engines—check the safety air filter (more often in dirty or dusty conditions).</li> <li>For Toro engines—replace the air filter (more often in dirty or dusty conditions).</li> <li>After the initial change—change the hydraulic-system filters and fluid when using Mobil 1 15W50 fluid. (Change it more often under dirty or dusty conditions)</li> </ul>
Every 300 hours	<ul style="list-style-type: none"> <li>For Kawasaki engines—Check and adjust the valve clearance. See an Authorized Service Dealer.</li> <li>For Toro engines—Check and adjust the valve clearance. See an Authorized Service Dealer.</li> </ul>
Every 500 hours	<ul style="list-style-type: none"> <li>For Kawasaki engines—replace the safety air filter (more often in dirty or dusty conditions).</li> <li>Replace the emissions-air intake filter.</li> <li>Replace the fuel filter (more often in dusty, dirty conditions).</li> <li>Check the parking brake adjustment.</li> <li>After the initial change—change the hydraulic-system filters and fluid when using Toro® HYPR-OIL™ 500 fluid. (Change it more often under dirty or dusty conditions)</li> </ul>
Monthly	<ul style="list-style-type: none"> <li>Check the battery charge.</li> </ul>
Yearly	<ul style="list-style-type: none"> <li>Greasing the caster-wheel hubs.</li> </ul>
Yearly or before storage	<ul style="list-style-type: none"> <li>Paint chipped surfaces.</li> <li>Complete all the procedures in the Storage chapter.</li> </ul>

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

## ⚠ CAUTION

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

Shut off the engine and remove the key from the switch before you perform any maintenance.

## Lubrication

### Greasing the Machine

**Service Interval:** Every 25 hours—Grease the front caster axles (more often in dirty or dusty conditions).

Every 50 hours—Grease the pump-idler pivot.

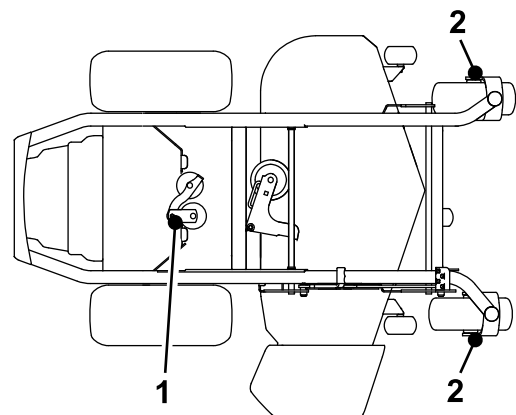
Grease the machine more often in dirty or dusty conditions.

**Grease Type:** No. 2 lithium or molybdenum grease

1. Park the machine on a level surface, disengage the blade-control switch, and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Clean the grease fittings with a rag.

**Note:** Scrape any paint off the front of the fitting(s).

4. Grease the pump idler-pulley pivot with 1 or 2 pumps of grease (Figure 40).
5. Grease the front caster axles (Figure 40).



**Figure 40**

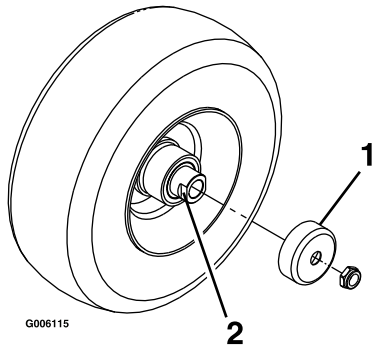
1. Pump-idler pivot
2. Caster axle

6. Wipe up any excess grease.

# Greasing the Caster-Wheel Hubs

**Service Interval:** Yearly

1. Park the machine on a level surface, disengage the blade-control switch, and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Raise the mower for access.
4. Remove the caster wheel from the caster forks.
5. Remove the seal guards from the wheel hub.



**Figure 41**

g006115

1. Seal guard
2. Spacer nut with wrench flats

13. With the open end of the wheel facing up, fill the area inside the wheel around the axle full of general-purpose grease.
14. Insert the second bearing and new seal into the wheel.
15. Apply a thread-locking compound to the second spacer nut, and thread it onto the axle with the wrench flats facing outward.
16. Torque the nut to 8 to 9 N·m (75 to 80 in-lb), loosen the nut, then torque it to 2 to 3 N·m (20 to 25 in-lb).

**Note:** Make sure that the axle does not extend beyond either nut.

17. Install the seal guards over the wheel hub, and insert the wheel into the caster fork.
18. Install the caster bolt and tighten the nut fully.

**Important:** To prevent seal and bearing damage, check the bearing adjustment often. Spin the caster tire. The tire should not spin freely (more than 1 or 2 revolutions) or have any side play. If the wheel spins freely, adjust the torque on the spacer nut until there is a slight amount of drag. Apply another layer of thread-locking compound.

6. Remove a spacer nut from the axle assembly in the caster wheel.

**Note:** Thread-locking compound has been applied to lock the spacer nuts to the axle.

7. Remove the axle (with the other spacer nut still assembled to it) from the wheel assembly.
8. Pry out seals and inspect bearings for wear or damage and replace if necessary.
9. Pack the bearings with a general-purpose grease.
10. Insert 1 bearing and 1 new seal into the wheel.
11. If the axle assembly is missing both spacer nuts, apply a thread-locking compound to 1 spacer nut and thread it onto the axle with the wrench flats facing outward.

**Note:** Do not thread the spacer nut all of the way onto the end of the axle. Leave approximately 3 mm (1/8 inch) from the outer surface of the spacer nut to the end of the axle inside the nut.

12. Insert the assembled nut and axle into the wheel on the side with the new seal and bearing.



# Engine Maintenance

## Engine Safety

- Shut off the engine before checking the oil or adding oil to the crankcase.
- Keep your hands, feet, face, clothing, and other body parts away from the muffler and other hot surfaces.

## Identifying the Engine

Use the following graphic to identify the engine you have and proceed to the section listed below for service (Figure 42).

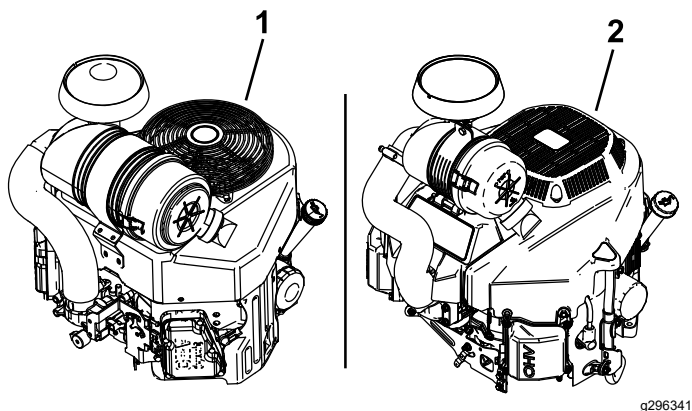


Figure 42

1. Kawasaki engine      2. Toro engine

- For Kawasaki engine maintenance, refer to [Servicing a Kawasaki® Engine \(page 41\)](#).
- For Toro engine maintenance, refer to [Servicing a Toro Engine \(page 46\)](#).

## Servicing a Kawasaki® Engine

This section is only for machines with Kawasaki engines. If your engine looks like the one shown in [Figure 43](#), you have a Kawasaki engine.

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

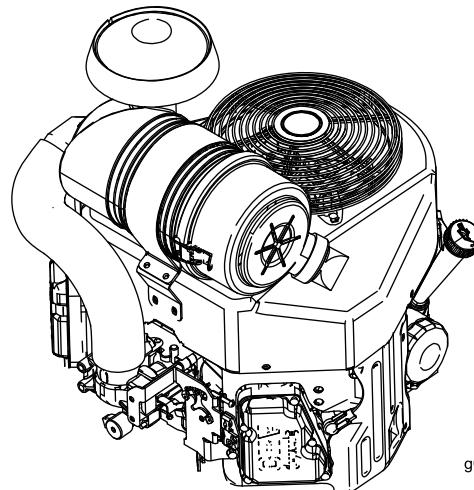


Figure 43

g036714

## Servicing the Air Cleaner

**Service Interval:** Every 250 hours—For Kawasaki engines—replace the primary air filter (more often in dirty or dusty conditions).

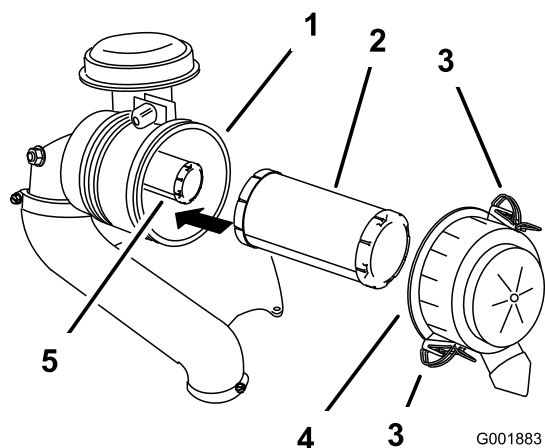
Every 250 hours—For Kawasaki engines—check the safety air filter (more often in dirty or dusty conditions).

Every 500 hours—For Kawasaki engines—replace the safety air filter (more often in dirty or dusty conditions).

**Note:** Service the air cleaner more frequently if operating conditions are extremely dirty or dusty.

### Removing the Filters

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Release the latches on the air cleaner and pull the air-cleaner cover off the air-cleaner body ([Figure 44](#)).



**Figure 44**

- |                     |                      |
|---------------------|----------------------|
| 1. Air-cleaner body | 4. Air-cleaner cover |
| 2. Primary filter   | 5. Safety filter     |
| 3. Latch            |                      |

4. Clean the inside of the air-cleaner cover with compressed air.
5. Gently slide the primary filter out of the air-cleaner body (Figure 44).

**Note:** Avoid knocking the filter into the side of the body.

6. Remove the safety filter only to replace it.

## Inspecting the Filters

1. Inspect the safety filter. If it is dirty, replace both the safety and primary filters.

**Important:** Do not attempt to clean the safety filter. If the safety filter is dirty, then the primary filter is damaged.

2. Inspect the primary filter for damage by looking into the filter while shining a bright light on the outside of the filter. If the primary filter is dirty, bent, or damaged, replace it.

**Note:** Holes in the filter appear as bright spots. Do not clean the primary filter.

## Installing the Filters

**Important:** To prevent engine damage, always operate the engine with both air filters and the cover installed.

1. If you are installing new filters, check each filter for shipping damage.

**Note:** Do not use a damaged filter.

2. If you are replacing the inner filter, carefully slide it into the filter body (Figure 44).

3. Carefully slide the primary filter over the safety filter (Figure 44).

**Note:** Ensure that the primary filter is fully seated by pushing on the outer rim while installing it.

**Important:** Do not press on the soft, inside area of the filter.

4. Install the air-cleaner cover and secure the latches (Figure 44).

# Servicing the Engine Oil

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

Every 100 hours (more often in dirty or dusty conditions).

Every 200 hours—For Kawasaki engines—change the engine-oil filter (more often in dirty or dusty conditions).

## Engine-Oil Specifications

**Oil Type:** Detergent oil (API service SF, SG, SH, SJ, or SL)

**Crankcase Capacity:** 1.8 L (61 fl oz) without the oil filter; 2.1 L (71 fl oz) with the oil filter

**Viscosity:** See the table below.

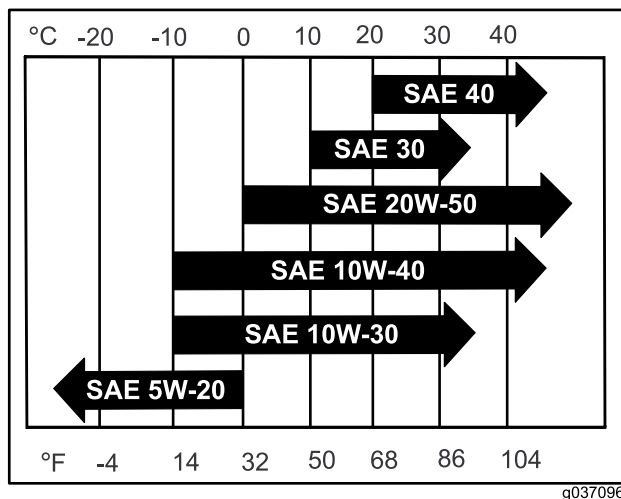


Figure 45

**Note:** Although 10W-40 engine oil is recommended for most conditions, you may need to change oil viscosity to accommodate atmospheric conditions. Using 20W-50 engine oil in higher ambient temperatures can reduce oil consumption.

## Checking the Engine-Oil Level

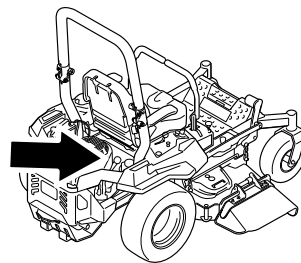
**Note:** Check the oil when the engine is cold.

**Important:** If you overfill or underfill the engine crankcase with oil and run the engine, you may damage the engine.

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.

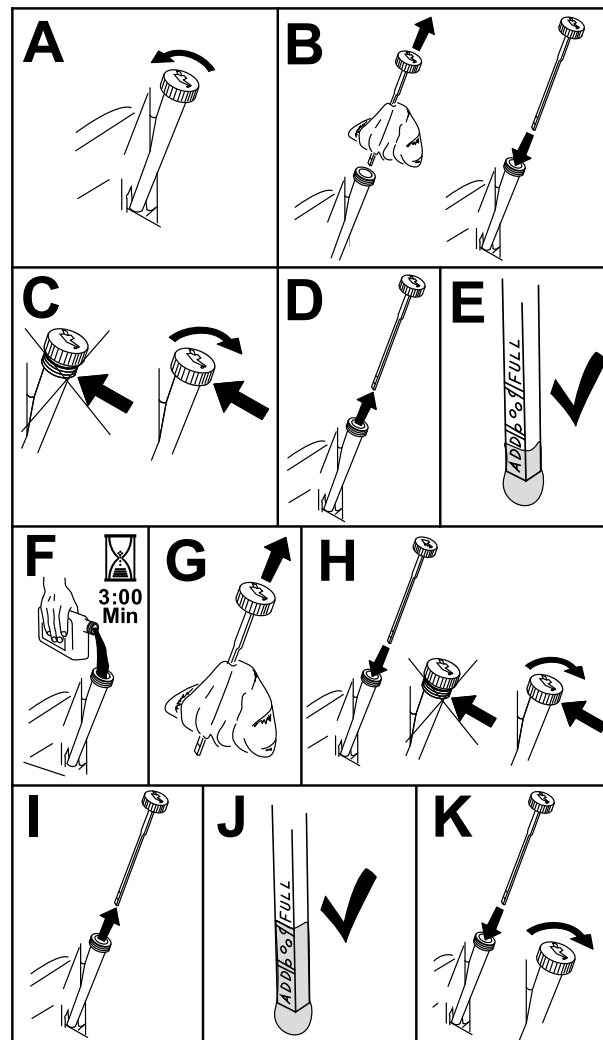
**Note:** Ensure that the engine is cool so that the oil has had time to drain into the sump.

3. To keep dirt, grass clippings, etc., out of the engine, clean the area around the oil-fill cap and dipstick before removing it (Figure 46).



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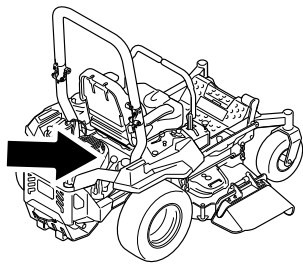
Figure 46

## Changing the Engine Oil

**Note:** Dispose of the used oil at a recycling center.

1. Start the engine and let it run for 5 minutes.  
**Note:** This warms the oil so that it drains better.
2. Park the machine so that the drain side is slightly lower than the opposite side to ensure that the oil drains completely.

3. Disengage the blade-control switch (PTO) and engage the parking brake.
4. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
5. Drain the oil from the engine (Figure 47).



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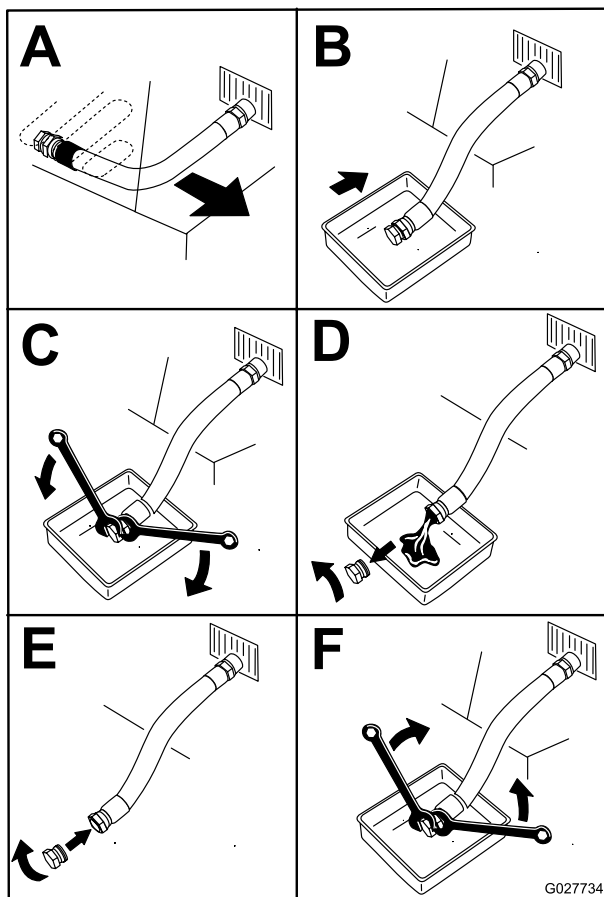
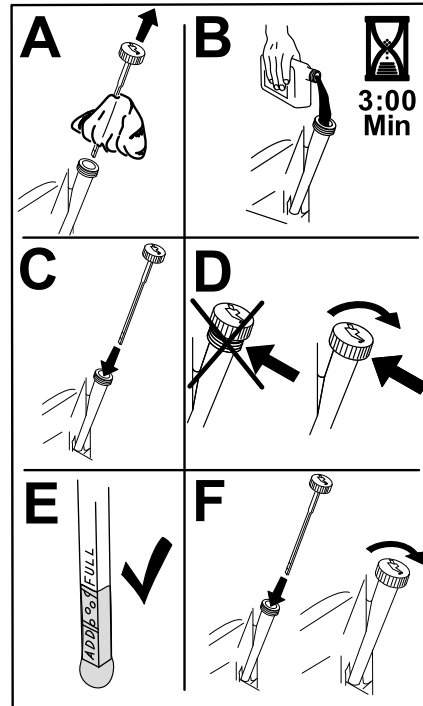


Figure 47

g027734

6. Slowly pour approximately 80% of the specified oil into the filler tube and slowly add the additional oil to bring it to the Full mark (Figure 48).



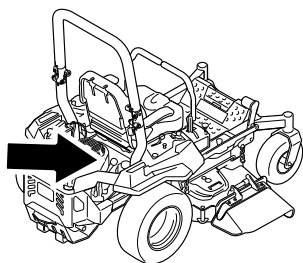
g235264

Figure 48

7. Start the engine and drive to a flat area.
8. Check the oil level again.

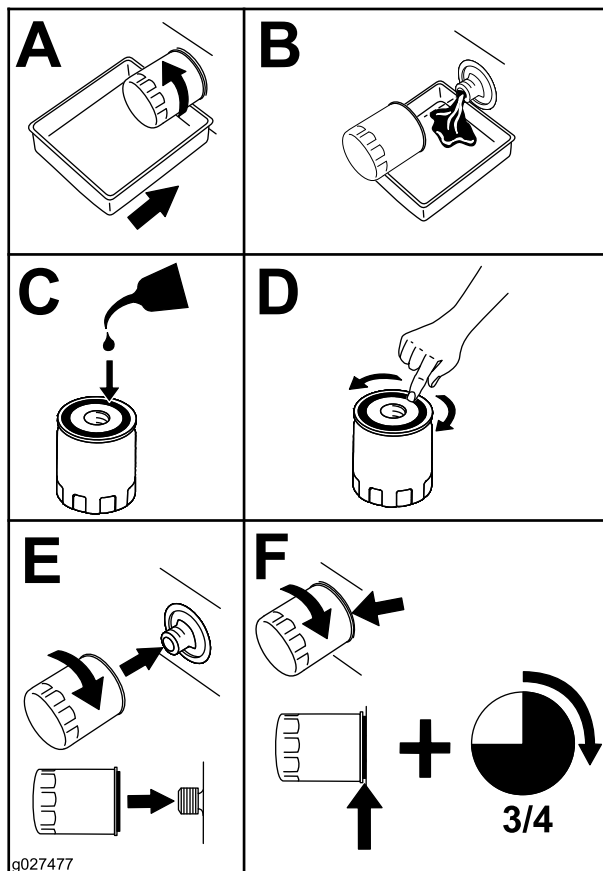
### Changing the Engine-Oil Filter

1. Drain the oil from the engine; refer to [Changing the Engine Oil \(page 43\)](#).
2. Change the engine-oil filter (Figure 49).



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Figure 49

**Note:** Ensure that the oil-filter gasket touches the engine, and then turn the oil filter an extra 3/4 turn.

3. Fill the crankcase with the proper type of new oil; refer to [Engine-Oil Specifications \(page 43\)](#).

## Servicing the Spark Plug(s)

**Service Interval:** Every 100 hours

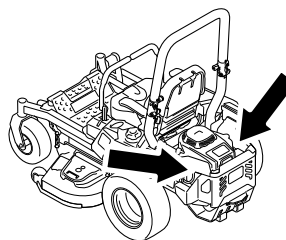
Ensure that the air gap between the center and side electrodes is correct before installing the spark plug. Use a spark plug wrench for removing and installing the spark plug and a gapping tool or feeler gauge to check and adjust the air gap. Install a new spark plug if necessary.

**Type of Spark Plug:** NGK® BPR4ES or equivalent

**Air Gap:** 0.75 mm (0.03 inch)

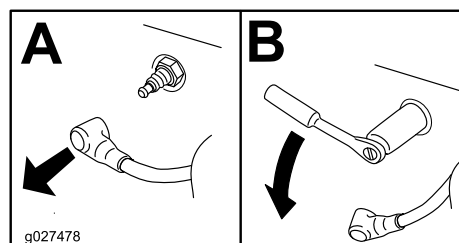
### Removing the Spark Plug(s)

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Clean the area around the base of the plug to keep dirt and debris out of the engine.
4. Locate and remove the spark plug(s) as shown in [Figure 50](#).



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g027478

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Figure 50

### Checking the Spark Plug(s)

**Important:** Do not clean the spark plug(s). Always replace the spark plug(s) when it has a black coating, worn electrodes, an oily film, or cracks.

If you see light brown or gray on the insulator, the engine is operating properly. A black coating on the insulator usually means the air cleaner is dirty.

Set the gap to 0.75 mm (0.03 inch).

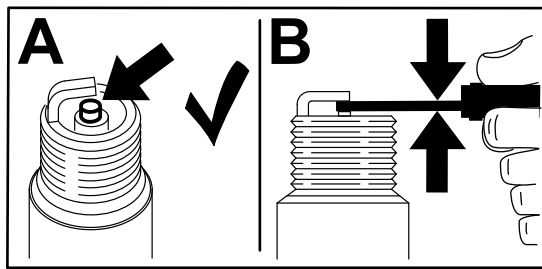


Figure 51

g206628

## Installing the Spark Plug(s)

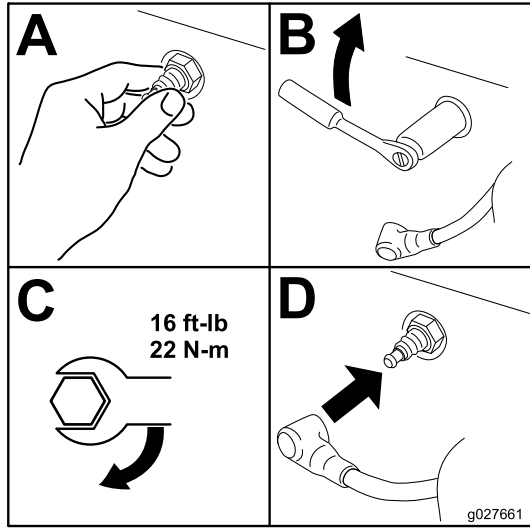


Figure 52

g027661

## Servicing a Toro Engine

This section is only for machines with Toro engines. If your engine looks like the one shown in [Figure 53](#), you have a Toro engine.

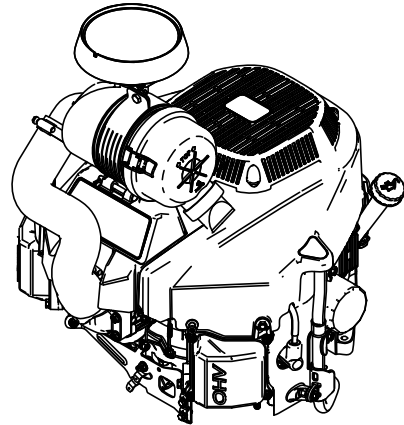


Figure 53

g296342

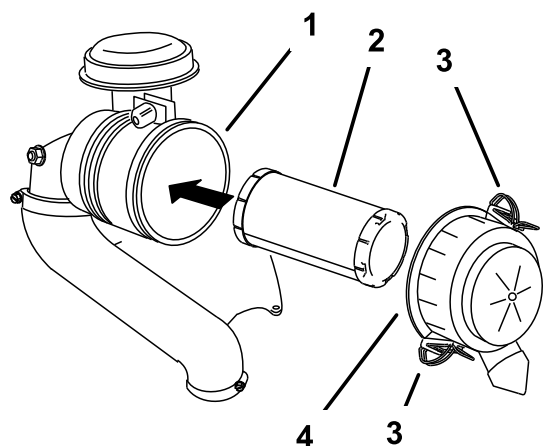
## Servicing the Air Cleaner

**Service Interval:** Every 250 hours—For Toro engines—replace the air filter (more often in dirty or dusty conditions).

**Note:** Service the air cleaner more frequently if operating conditions are extremely dusty or sandy.

### Removing the Filter

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Release the latches on the air cleaner and pull the air-cleaner cover off the air-cleaner body ([Figure 55](#)).



**Figure 54**

g230914

- |                     |                      |
|---------------------|----------------------|
| 1. Air-cleaner body | 3. Latch             |
| 2. Filter           | 4. Air-cleaner cover |

4. Clean the inside of the air-cleaner cover with compressed air.
5. Gently slide the filter out of the air-cleaner body (Figure 55).

**Note:** Avoid knocking the filter into the side of the body.

## Inspecting the Filter

Inspect the filter for damage by looking into the filter while shining a bright light on the outside of the filter. If the filter is dirty, bent, or damaged, replace it.

**Note:** Holes in the filter appear as bright spots. Do not clean the filter.

## Installing the Filter

**Important:** To prevent engine damage, always operate the engine with the air filter and the cover installed.

1. If you are installing a new filter, check the filter for shipping damage.

**Note:** Do not use a damaged filter.

2. Carefully slide the filter into the air-cleaner body (Figure 55).

**Note:** Ensure that the filter is fully seated by pushing on the outer rim while installing it.

**Important:** Do not press on the soft, inside area of the filter.

3. Install the air-cleaner cover and secure the latches (Figure 55).

# Servicing the Engine Oil

**Service Interval:** Before each use or daily—For Toro engines—check the engine-oil level.

After the first 5 hours/After the first month (whichever comes first)—For Toro engines—change the engine oil and filter.

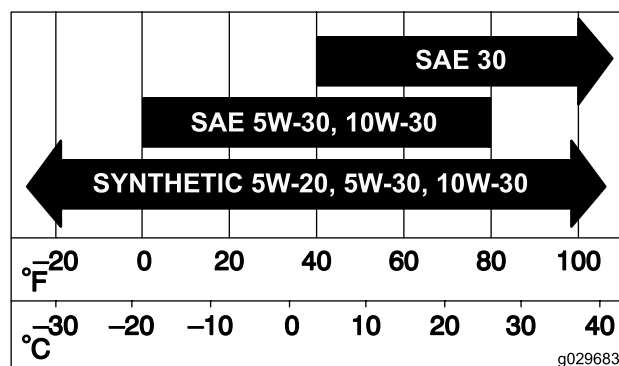
Every 100 hours or yearly, whichever comes first—For Toro engines—change the engine oil and oil filter (more often in dirty or dusty conditions).

## Engine-Oil Specifications

**Oil Type:** Detergent oil (API service SF, SG, SH, SJ, or SL)

**Crankcase Capacity:** 2.4 L (81 fl oz) with oil filter

**Viscosity:** See the table below.



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g029683

**Figure 55**

## Checking the Engine-Oil Level

**Note:** Check the oil when the engine is cold.

**Important:** If you overfill or underfill the engine crankcase with oil and run the engine, you may damage the engine.

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.

**Note:** Ensure that the engine is cool so that the oil has had time to drain into the sump.

3. To keep dirt, grass clippings, etc., out of the engine, clean the area around the oil-fill cap and dipstick before removing it (Figure 46).



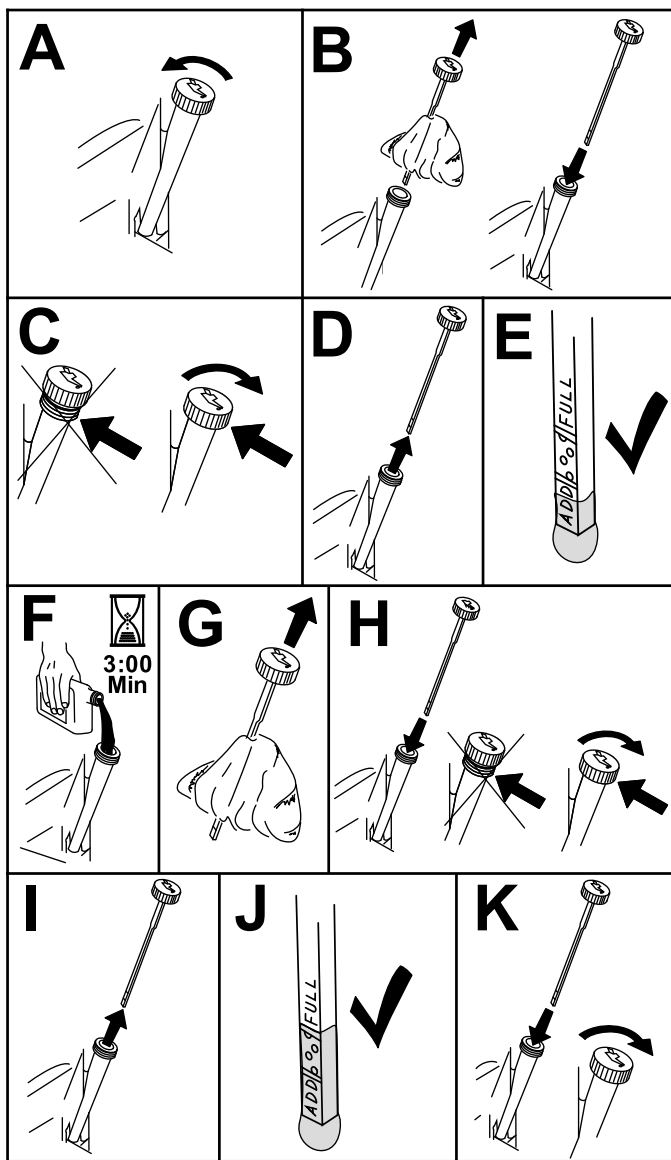
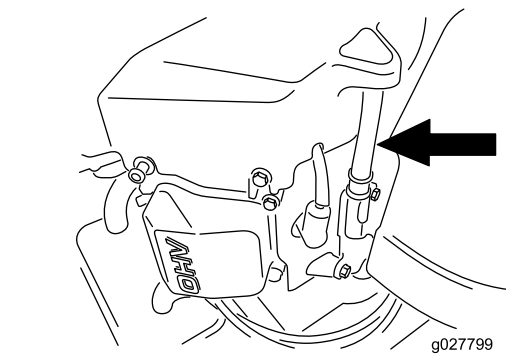


Figure 56

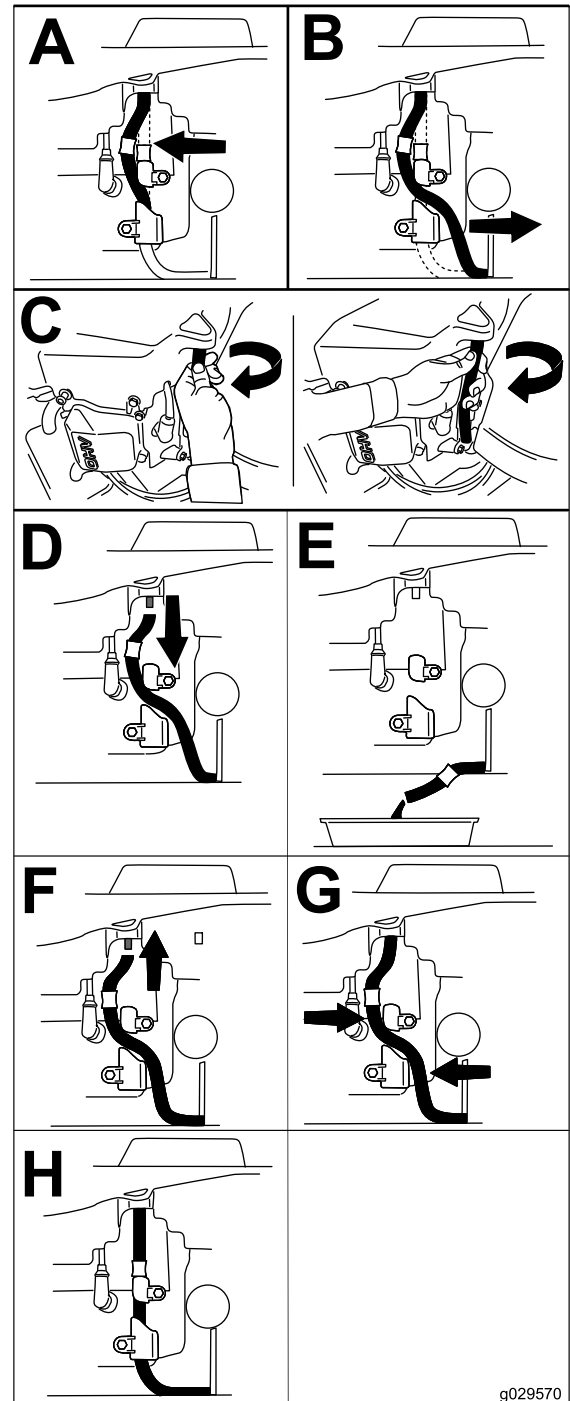
## Changing the Engine Oil and Oil Filter

1. Park the machine on a level surface to ensure that the oil drains completely.
2. Disengage the blade-control switch (PTO) and engage the parking brake.
3. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
4. Drain the oil from the engine.



g027799

g027799



g029570

g029570

Figure 57



- Change the engine-oil filter ([Figure 58](#)).

**Note:** Ensure that the oil-filter gasket touches the engine and then turn the filter an extra 3/4 turn.

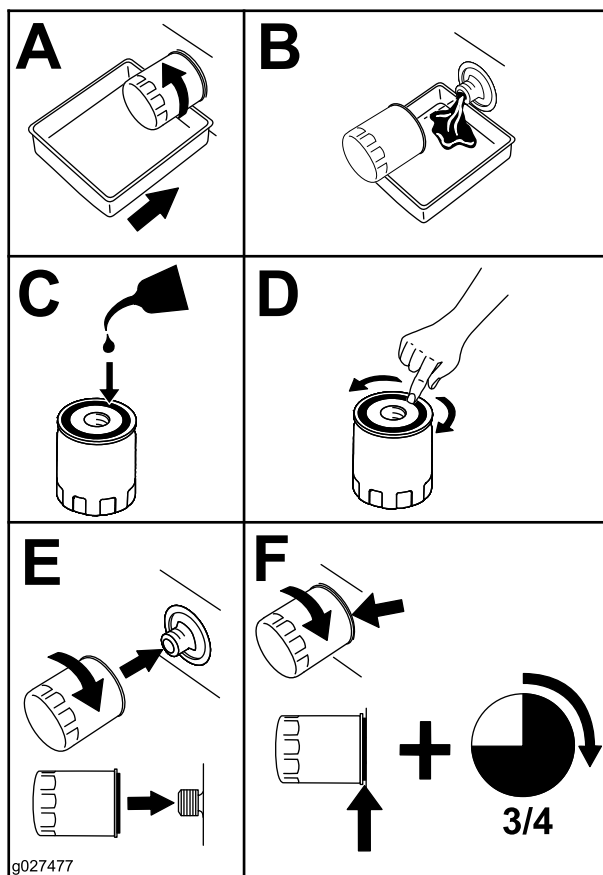


Figure 58

- Slowly pour approximately 80% of the specified oil into the filler tube and slowly add the additional oil to bring it to the Full mark ([Figure 59](#)).

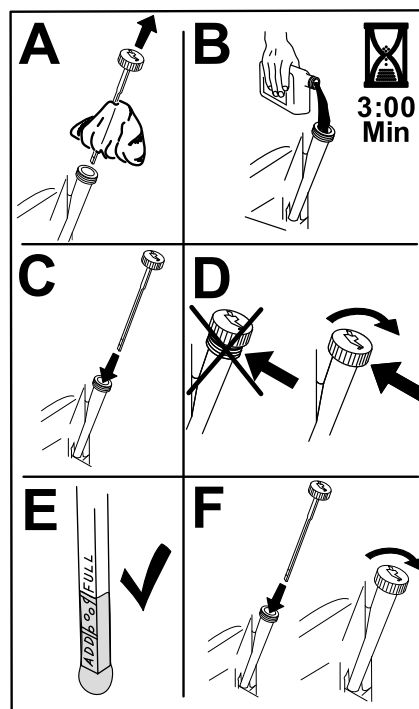


Figure 59

g235264

- Dispose of the used oil at a recycling center.

## Servicing the Spark Plug(s)

**Service Interval:** Every 100 hours or yearly, whichever comes first—For Toro engines—check the spark plug(s).

Every 200 hours/Every 2 years (whichever comes first)—For Toro engines—replace the spark plug(s).

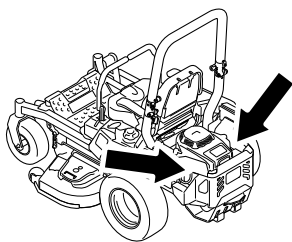
Ensure that the air gap between the center and side electrodes is correct before installing the spark plug. Use a spark plug wrench for removing and installing the spark plug and a gapping tool or feeler gauge to check and adjust the air gap. Install a new spark plug if necessary.

**Type:** Champion® RN9YC or NGK® BPR6ES

**Air gap:** 0.76 mm (0.03 inch)

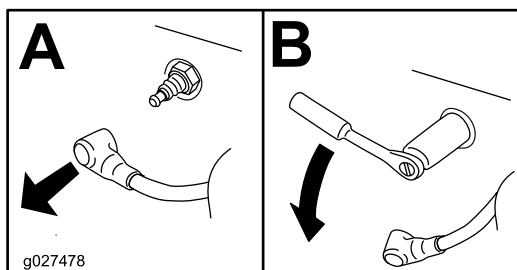
## Removing the Spark Plug(s)

- Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
- Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
- Clean the area around the base of the plug to keep dirt and debris out of the engine.
- Locate and remove the spark plug(s) as shown in [Figure 61](#).



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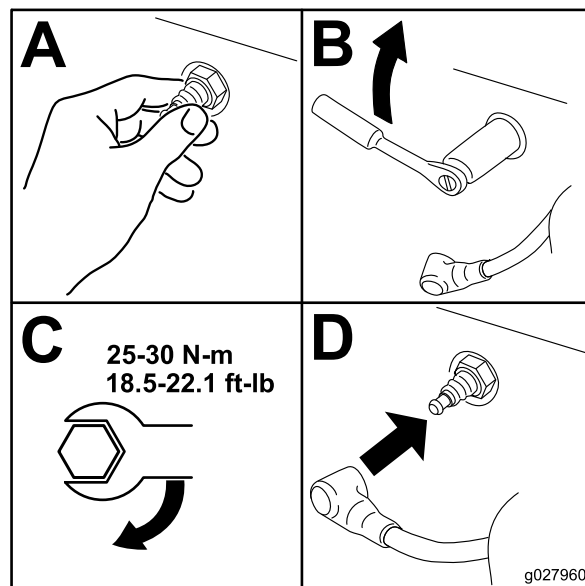


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Figure 60

## Installing the Spark Plug(s)



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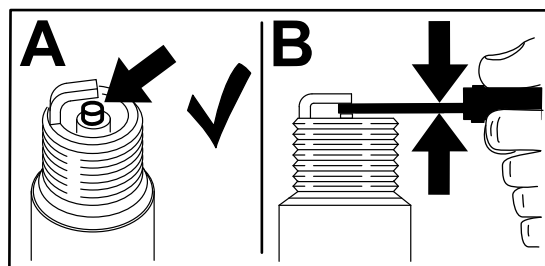
Figure 62

## Checking the Spark Plug(s)

**Important:** Do not clean the spark plug(s). Always replace the spark plug(s) when it has a black coating, worn electrodes, an oily film, or cracks.

If you see light brown or gray on the insulator, the engine is operating properly. A black coating on the insulator usually means the air cleaner is dirty.

Set the gap to 0.76 mm (0.03 inch).



g206628

Figure 61

## Cleaning the Blower Housing

To ensure proper cooling, ensure that the grass screen, cooling fins, and other external surfaces of the engine are kept clean at all times.

**Important:** Operating the engine with a blocked grass screen, dirty or plugged cooling fins, and/or cooling shrouds removed, will cause engine damage due to overheating.

## Cleaning the Cooling System

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Remove the air filter from the engine.
4. Remove the engine shroud.
5. To prevent debris entering the air intake, install the air filter to the filter base.
6. Clean debris and grass from the parts.
7. Remove the air filter and install the engine shroud.
8. Install the air filter.

# Checking the Spark Arrester

## For Machines with a Spark Arrester

Service Interval: Every 50 hours

### ⚠ WARNING

Hot exhaust-system components may ignite fuel vapors even after you shut off the engine. Hot particles exhausted during engine operation may ignite flammable materials, resulting in personal injury or property damage.

**Do not refuel or run the engine unless the spark arrester is installed.**

1. Park the machine on a level surface, disengage the PTO, and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Wait for the muffler to cool.
4. If you see any breaks in the screen or welds, replace the arrester.
5. If the screen is plugged, remove the arrester, shake loose particles out of the arrester, and clean the screen with a wire brush (soak the screen in solvent if necessary).
6. Install the arrester on the exhaust outlet.

## Replacing the Emissions-Air Intake Filter

Service Interval: Every 500 hours

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Remove the filter from the vent hose.
4. Insert a new filter into the end of the vent hose.

# Fuel System Maintenance

### ⚠ DANGER

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

Refer to [Fuel Safety \(page 17\)](#) for a complete list of fuel related precautions.

## Replacing the Fuel Filter

Service Interval: Every 500 hours/Yearly (whichever comes first) (more often in dusty, dirty conditions).

**Important:** Install the fuel line hoses and secure with plastic ties the same as they were originally installed at the factory to keep the fuel line away from components that can cause fuel line damage.

The fuel filter is located near the engine on the left front of the engine.

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Allow the machine to cool down.
4. Close the fuel-shutoff valve under the seat ([Figure 63](#)).

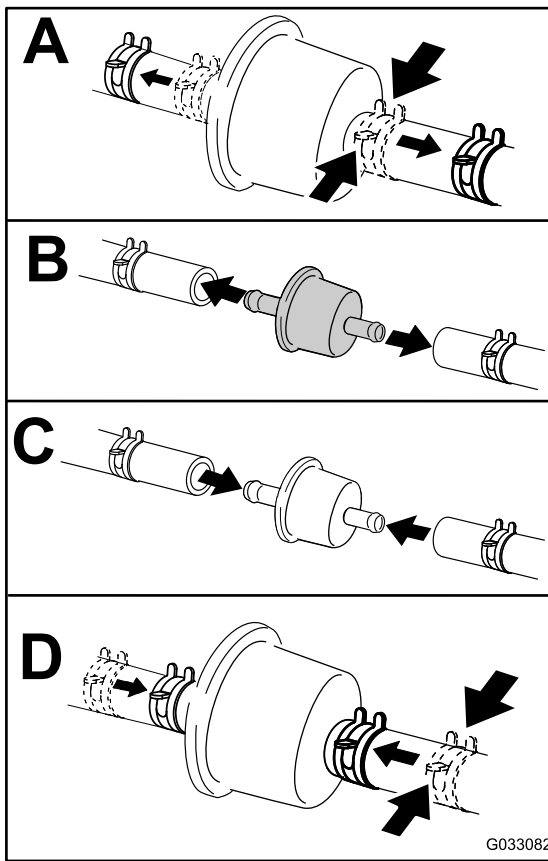


Figure 63

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5. Open the fuel-shutoff valve.

## Servicing the Fuel Tank

Do not attempt to drain the fuel tank. Ensure that an Authorized Service Dealer drains the fuel tank and services any components of the fuel system.

## Electrical System Maintenance

### Electrical System Safety

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

### Servicing the Battery

Service Interval: Monthly

### Removing the Battery

#### ⚠ WARNING

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

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

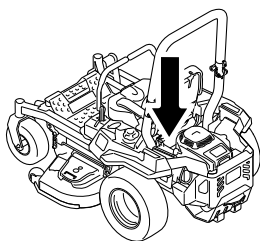
#### ⚠ WARNING

Incorrectly removing the cables from battery could damage the machine 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.

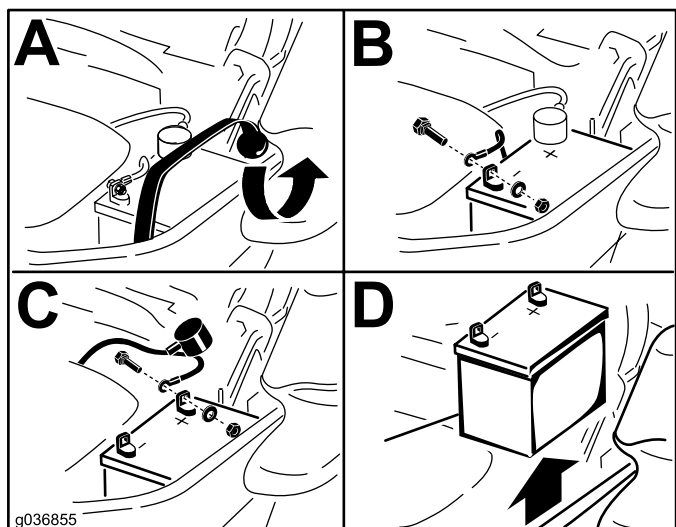
1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.

2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Remove the battery as shown in [Figure 64](#).



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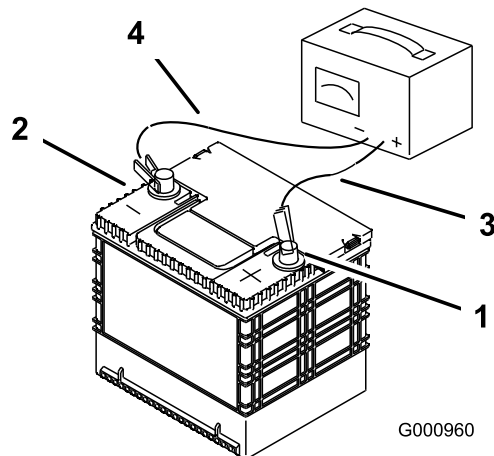
g036855

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Figure 64

4. Install the battery in the machine and connect the battery cables; refer to [Installing the Battery \(page 54\)](#).

**Note:** Do not run the machine with the battery disconnected; electrical damage may occur.



G000960

g000960

Figure 65

- |                              |                           |
|------------------------------|---------------------------|
| 1. Positive (+) battery post | 3. Red (+) charger lead   |
| 2. Negative (-) battery post | 4. Black (-) charger lead |

## Charging the Battery

### **⚠ WARNING**

Charging the battery produces gasses that can explode.

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

**Important:** Always keep the battery fully charged (1.265 specific gravity). This is especially important to prevent battery damage when the temperature is below 0°C (32°F).

1. Remove the battery from the chassis; refer to [Removing the Battery \(page 52\)](#).
2. Charge the battery for 10 to 15 minutes at 25 to 30 A or for 30 minutes at 10 A.

**Note:** Do not overcharge the battery.

3. When the battery is fully charged, unplug the charger from the electrical outlet, then disconnect the charger leads from the battery posts ([Figure 65](#)).

## Installing the Battery

1. Position the battery in the tray with the terminal posts opposite from the hydraulic tank (Figure 64).
2. Install the positive (red) battery cable to the positive (+) battery terminal.
3. Install the negative (black) battery cable and ground wire to the negative (-) battery terminal.

**Note:** For MyRide machines, ensure that the ground cable does not rub against the trailing arm or lower shock mount (Figure 67).

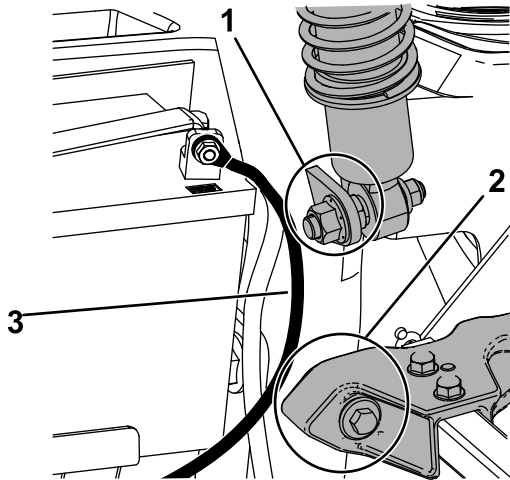


Figure 66

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1. Ensure that the ground cable does not rub against the lower shock mount.
2. Ensure that the ground cable does not rub against the trailing arm.
3. Ground cable

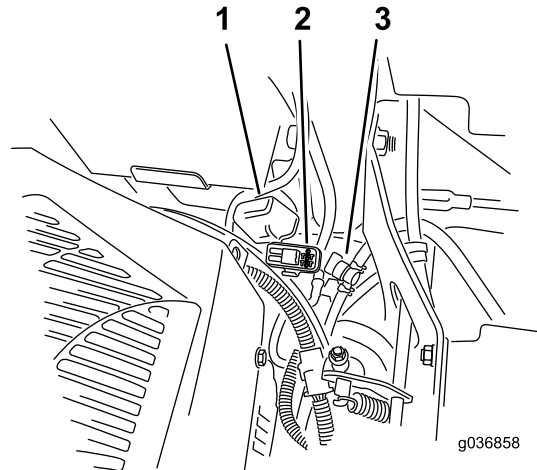
4. Secure the cables with 2 bolts, 2 washers, and 2 locknuts (Figure 64).
5. Slide the red terminal boot onto the positive (+) battery terminal.
6. Secure the battery with the rubber strap (Figure 64).

## Servicing the Fuses

The electrical system is protected by fuses. It requires no maintenance; however, if a fuse blows check the component and circuit for a malfunction or short.

The fuses are located on the right console next to the seat (Figure 67).

1. To replace the fuses, pull out the fuse to remove it.
2. Install a new fuse (Figure 67).



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g036858

Figure 67

1. Fuse cover
2. Fuse holder
3. Fuel-shutoff valve

# Drive System Maintenance

## Checking the Seat Belt

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

Inspect the seat belt for wear, cuts, and proper operation of the retractor and buckle. Replace the seat belt if it is damaged.

## Checking the Roll-Bar Knobs

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

### ⚠ WARNING

To avoid injury or death from rollover, keep the roll bar in the fully raised, locked position and use the seat belt.

Ensure that the seat is secured to the machine.

- Check that both the mounting hardware and the knobs are in good working condition.
- Make sure that the knobs are fully engaged with the roll bar in the raised position.

**Note:** The upper hoop of the roll bar may need to be pushed forward or pulled rearward to fully engage both knobs ([Figure 68](#) and [Figure 69](#)).

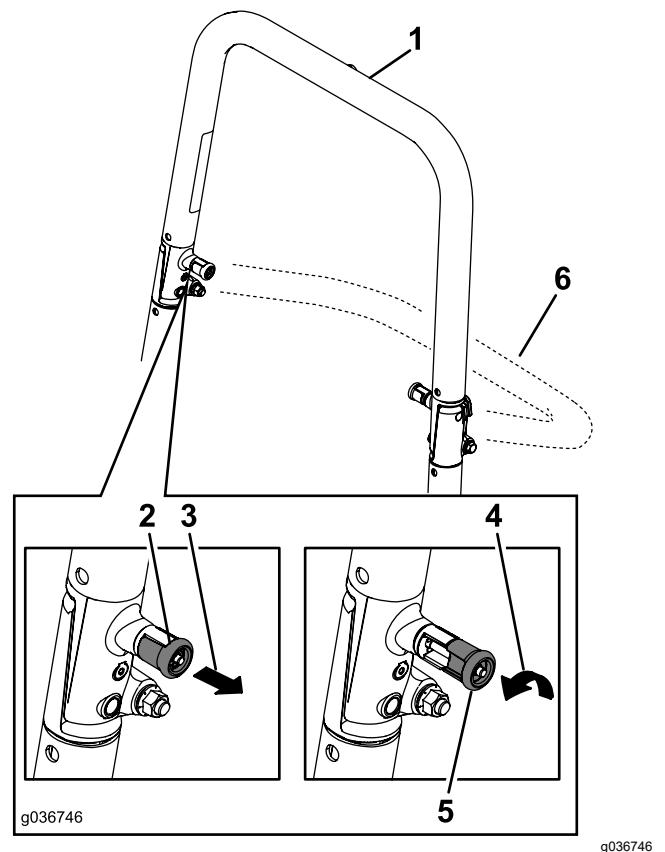


Figure 68

1. Roll bar in the upright position
2. Roll-bar knob in the latched position
3. Pull the roll-bar knob out and rotate it 90 degrees.
4. Rotate the roll-bar knob 90 degrees.
5. Roll-bar knob in the unlatched position
6. Roll bar in the folded position

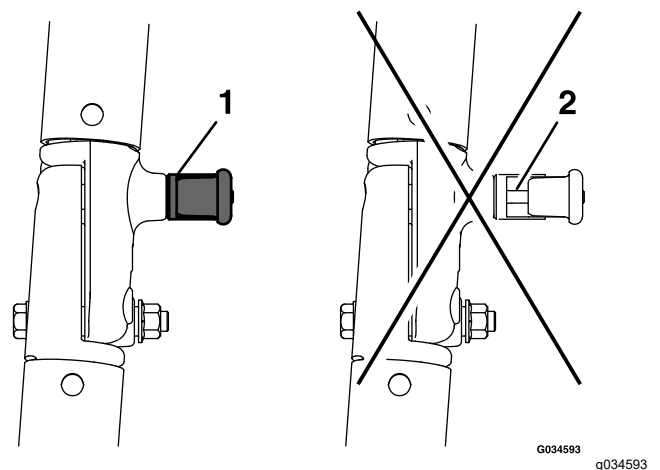
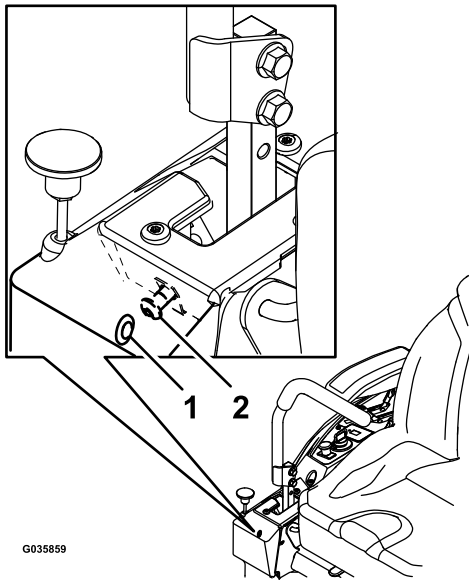


Figure 69

1. Engaged
2. Partially engaged—do not operate with the roll bar in this position.

## Adjusting the Tracking

1. Disengage the blade-control switch (PTO).
2. Drive to an open, flat area and move the motion-control levers to the NEUTRAL-LOCK position.
3. Move the throttle midway between the FAST and SLOW positions.
4. Move both motion-control levers forward until they both hit the stops in the T-slot.
5. Check which way the machine tracks.
6. If the machine tracks to the right, insert a 3/16 inch hex wrench through the access hole in the right front cover panel and rotate the tracking screw clockwise or counterclockwise to adjust the travel of the lever (Figure 70).
7. If the machine tracks to the left, insert a 3/16 inch hex wrench through the access hole in the right front cover panel and rotate the tracking screw clockwise or counterclockwise to adjust the travel of the lever (Figure 70).
8. Drive the machine and check the full forward tracking.
9. Repeat the adjustment until the desired tracking is obtained.



**Figure 70**

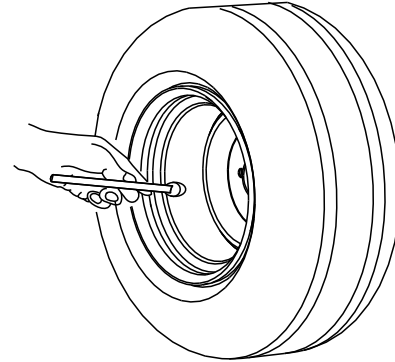
Right control lever shown

1. Access hole on front cover panel
2. Tracking screw

## Checking the Tire Pressure

**Service Interval:** Every 50 hours/Monthly (whichever comes first)

Maintain the air pressure in the front and rear tires at 90 kPa (13 psi). Uneven tire pressure can cause uneven cut. Check the tires when they are cold to get the most accurate pressure reading.



**Figure 71**

## Checking the Wheel Lug Nuts

Check and torque the wheel lug nuts to 122 to 136 N·m (90 to 100 ft-lb).



# Cooling System Maintenance

## Cleaning the Engine Screen

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

Before each use or daily

Before each use remove any buildup of grass, dirt, or other debris from the engine screen, engine exhaust, and the area around the engine. This helps ensure adequate cooling and correct engine speed and reduces the possibility of overheating and mechanical damage to the engine.

# Brake Maintenance

## Adjusting the Parking Brake

**Service Interval:** Every 500 hours

**Note:** Perform this procedure whenever you remove or replace a brake component.

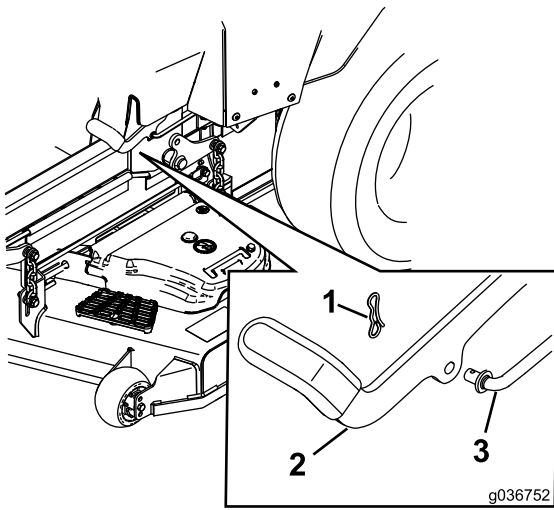
1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Set up the machine to be pushed by hand. Refer to [Using the Drive-Wheel Release Valves \(page 34\)](#).
4. Raise the back of the machine up and support the machine with jack stands.

### **⚠ WARNING**

**Relying solely on mechanical or hydraulic jacks to support a raised machine for service or maintenance could be dangerous because the jacks may not provide enough support or may malfunction, allowing the machine to fall and possibly cause serious injury.**

**Do not rely solely on mechanical or hydraulic jacks for support. Use adequate jack stands or equivalent support.**

5. Engage and disengage the parking brake and check each drive tire to ensure that each brake engages and disengages.
6. If an adjustment is necessary, disengage the parking brake. Remove the cotter pin from the brake linkage shaft ([Figure 72](#)).

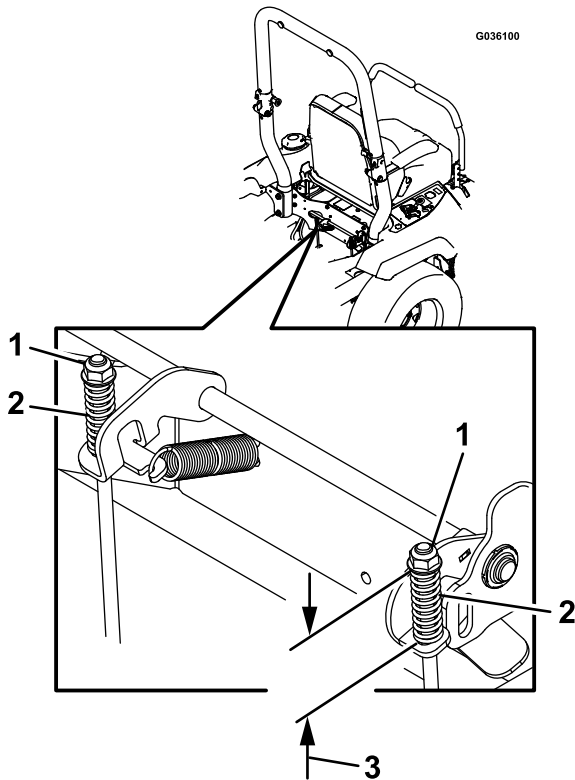


**Figure 72**

g036752

1. Cotter pin
2. Parking brake
3. Brake linkage shaft

7. Check both spring lengths as shown in [Figure 73](#). If an adjustment is necessary, turn the top nut clockwise to shorten the spring and counterclockwise to lengthen it.



**Figure 73**

g036100

1. Top nut
2. Spring
3. 44 mm (1-3/4 inches)

8. Push the parking brake lever all the way forward and down.

9. Rotate the brake-linkage shaft until the end aligns with the hole in the lever.
  - Shorten the linkage by turning it clockwise.
  - Lengthen the linkage by turning it counterclockwise.
10. Insert the brake-linkage shaft into the parking-brake hole and secure with the cotter pin. Repeat step 5 and adjust if necessary.
11. When adjustment is complete, remove the jack stands or equivalent support and lower the machine.
12. Place the machine into the OPERATING position. Refer to [Using the Drive-Wheel Release Valves \(page 34\)](#).

# Belt Maintenance

## Inspecting the Belts

**Service Interval:** Every 50 hours

Replace the belt if it is worn. The signs of a worn belt include squealing while the belt is rotating; the blades slipping while cutting grass; and frayed edges, burn marks, and cracks on the belt.

## Replacing the Mower Belt

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Lower the mower to the 76 mm (3 inches) height of cut.
4. Remove the belt covers (Figure 74).

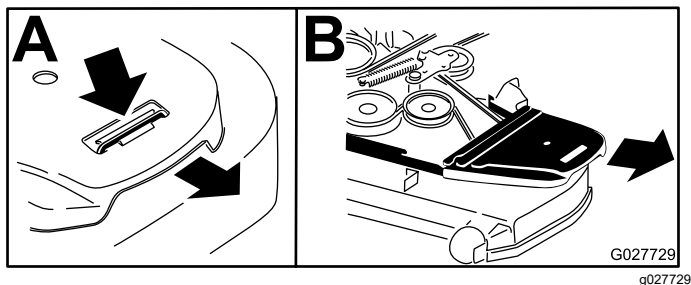


Figure 74

5. Remove the spring tension from the spring-loaded idler pulley; refer to Figure 76.  
**Note:** Use the spring removal tool (Toro Part No. 92-5771) to remove the spring from the mower-deck post (Figure 76).
6. Remove the belt from the mower-deck pulleys and the clutch pulley.
7. Install the new belt around the mower pulleys and the clutch pulley under the engine (Figure 75).

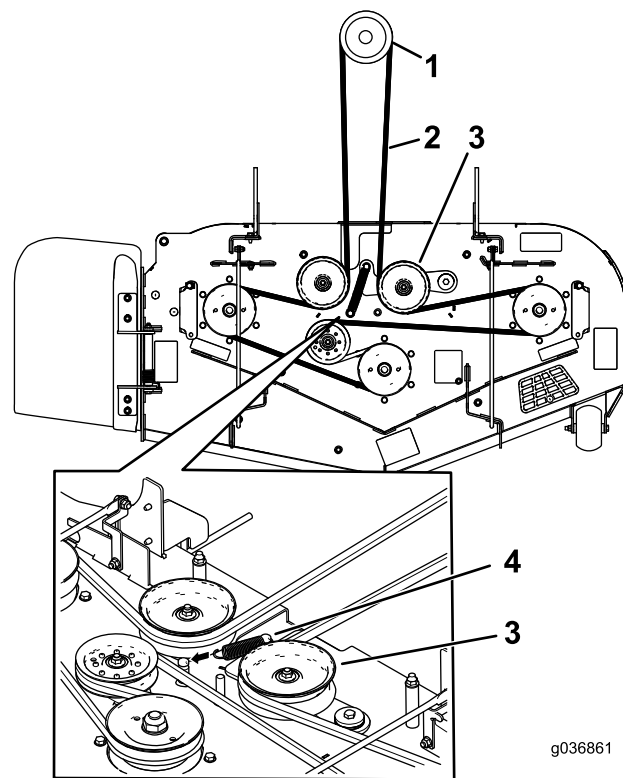


Figure 75

- |                  |                               |
|------------------|-------------------------------|
| 1. Clutch pulley | 3. Spring-loaded idler pulley |
| 2. Mower belt    | 4. Spring                     |

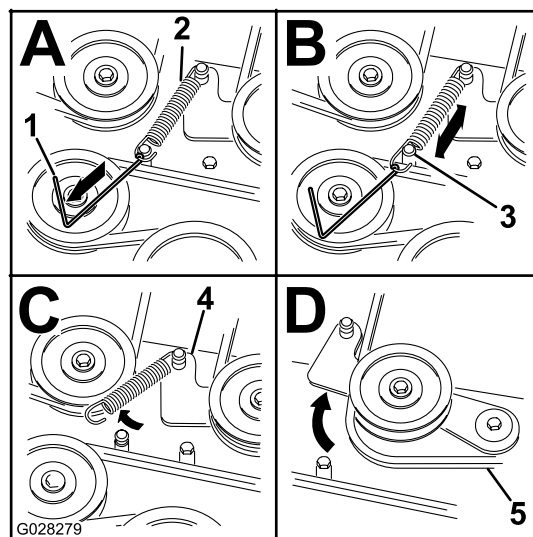


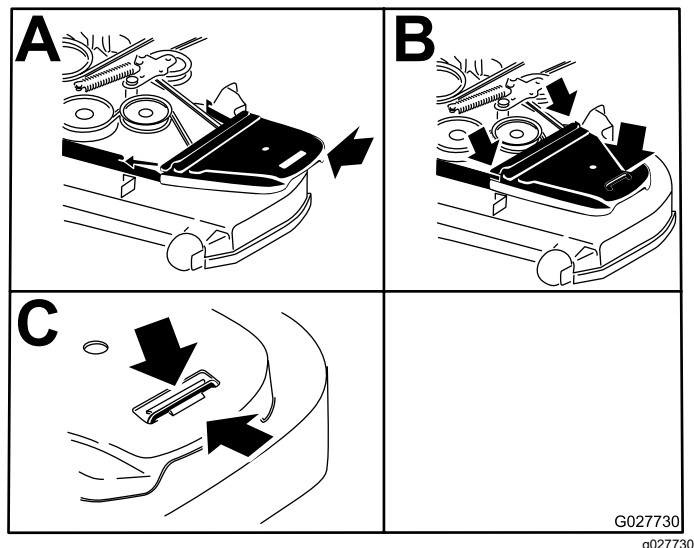
Figure 76

- |  |               |
|--|---------------|
| 1. Spring-removal tool (Toro Part No. 92-5771) | 4. Idler arm  |
| 2. Idler spring                                | 5. Mower belt |
| 3. Mower-deck post                             |               |

8. Install the idler spring (Figure 75).

**Note:** Seat the spring ends in the anchor grooves.

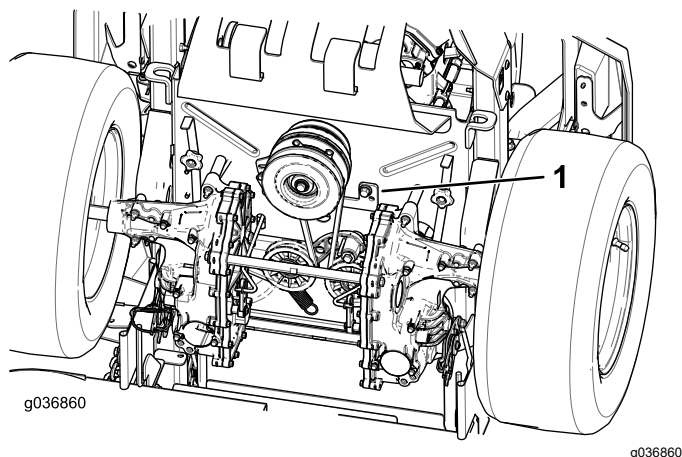
9. Install the belt covers ([Figure 77](#)).



**Figure 77**

## Replacing the Hydraulic Pump-Drive Belt

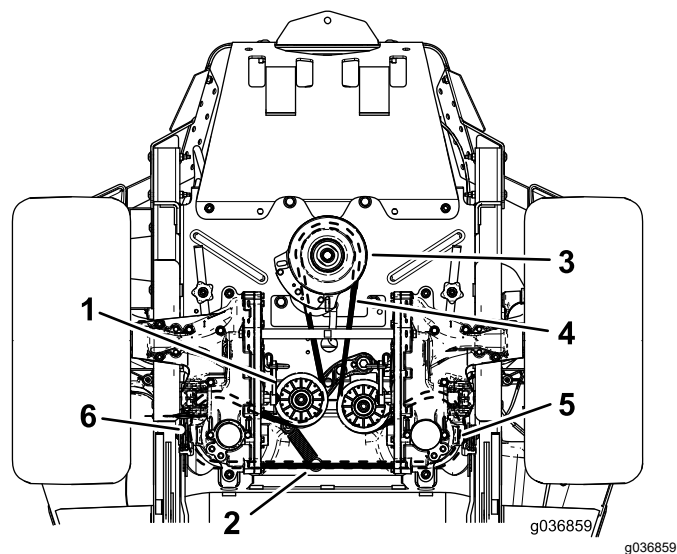
1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Remove the mower belt; refer to [Replacing the Mower Belt](#) (page 59).
4. Raise the machine and support it with jack stands ([Figure 79](#)).
5. Remove the clutch stop ([Figure 78](#)).



**Figure 78**

1. Clutch stop

6. Remove the idler spring from the post ([Figure 79](#)).
7. Remove the existing belt from the hydraulic-pump-drive pulleys and the engine pulley.
8. Install the new belt around the engine pulley and the 2 hydraulic-pump pulleys ([Figure 79](#)).



**Figure 79**

- |                      |                                |
|----------------------|--------------------------------|
| 1. Idler pulley      | 4. Pump-drive belt             |
| 2. Idler-spring post | 5. Right hydraulic-pump pulley |
| 3. Engine pulley     | 6. Left hydraulic-pump pulley  |

9. Install the clutch stop ([Figure 78](#)).
10. Install the mower belt; refer to [Belt Maintenance](#) (page 59).

# Controls System Maintenance

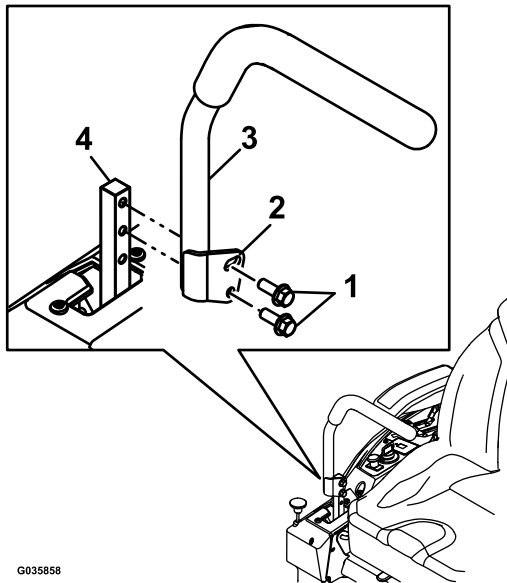
## Adjusting the Control-Handle Position

If the ends of the levers hit against each other, refer to [Adjusting the Motion-Control Linkage \(page 62\)](#).

## Adjusting the Height

You can adjust the motion control levers higher or lower for maximum comfort.

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Remove the hardware holding the control lever to the control-arm shaft.



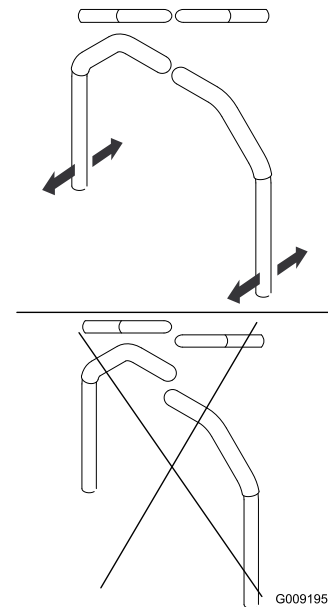
**Figure 80**

- |                 |                      |
|-----------------|----------------------|
| 1. Bolts        | 3. Control lever     |
| 2. Slotted hole | 4. Control-arm shaft |

4. Move the control lever to the next set of holes. Secure the lever with the hardware.
5. Repeat the adjustment for the opposite control lever.

## Adjusting the Tilt

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Loosen the upper bolt holding the control lever to the control arm shaft.
4. Loosen the lower bolt just enough to pivot the control lever fore or aft. Tighten both bolts to secure the control in the new position.
5. Repeat the adjustment for the opposite control lever.



**Figure 81**

# Adjusting the Motion-Control Linkage

Located on either side of the machine, below the seat, are the pump-control linkages. Rotating the end nut with a 1/2-inch deep socket wrench allows fine tuning adjustments so that the machine does not move in neutral. Any adjustments should be made for neutral positioning only.

## ⚠ WARNING

**The engine must be running and the drive wheels turning so that you can perform the adjustments. Contact with moving parts or hot surfaces may cause personal injury.**

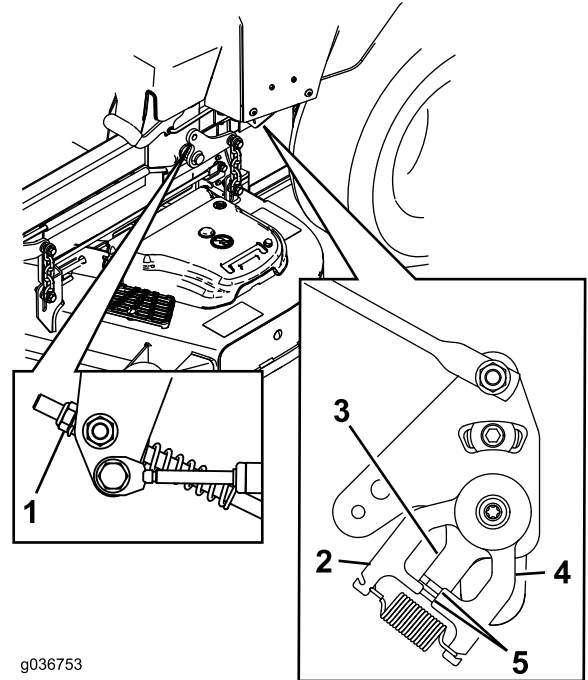
**Keep your fingers, hands, and clothing clear of rotating components and hot surfaces.**

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Push the deck-lift pedal, remove the height-of-cut pin, and lower the mower deck to the ground
4. Raise the rear of the machine up and support it with jack stands (or equivalent support) just high enough to allow the drive wheels to turn freely.
5. Remove the electrical connection from the seat safety switch, located under the bottom cushion of the seat.

**Note:** The switch is a part of the seat assembly.

6. **Temporarily** install a jumper wire across the terminals in the connector of the main wire harness.
7. Start the engine, run it at full throttle, and disengage the parking brake.  
**Note:** Before starting the engine, ensure that the parking brake is engaged and that the motion-control levers are out. You do not have to be in the seat.
8. Run the machine at least 5 minutes with the drive levers at full forward speed to bring the hydraulic fluid up to the operating temperature.  
**Note:** The motion-control levers must be in neutral while you are making any adjustments.
9. Bring the motion-control levers into the NEUTRAL position.
10. Check and ensure that the control-plate tabs touch the return-to-neutral plates on the hydraulic units.

11. Adjust the pump-control-rod lengths by rotating the nut in the appropriate direction until the wheels slightly creep in reverse (Figure 82).



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**Figure 82**

- |                     |  |
|---------------------|--|
| 1. Nut              | 4. Return-to-neutral plate               |
| 2. Stationary plate | 5. Tabs touching return to neutral plate |
| 3. Control plate    |  |
- 
12. Move the motion-control levers to the REVERSE position and while applying slight pressure to the lever, allow the reverse-indicator springs to bring the levers back to neutral.  
**Note:** The wheels should stop turning or slightly creep in reverse.  
**Note:** You may need to remove the motion-control cover to gain access.
  13. Shut off the machine.
  14. Remove the jumper wire from the wire harness and plug the connector into the seat switch.
  15. Remove the jack stands.
  16. Raise the mower deck and install the height-of-cut pin.
  17. Check and ensure that the machine does not creep in neutral with the parking brake disengaged.



# Hydraulic System Maintenance

## Hydraulic System Safety

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

## Hydraulic Fluid Specifications

**Hydraulic Fluid Type:** Toro® HYPR-OIL™ 500 hydraulic fluid or Mobil 1 15W-50 oil.

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

**Hydraulic System Capacity (with filters removed):**  
4.45 L (150 fl oz)

## Checking the Hydraulic Fluid Level

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

1. Allow the hydraulic fluid to cool down. Check the oil level when the fluid is cold.
2. Check expansion reservoir and if necessary add Toro® HYPR-OIL™ 500 hydraulic fluid to the FULL COLD line.

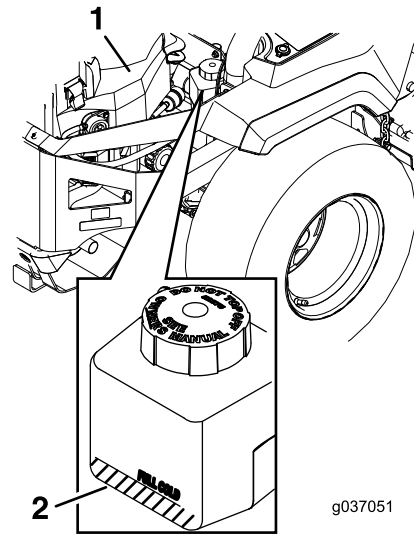


Figure 83

1. Engine

2. Expansion tank

## Changing the Hydraulic Fluid and Filters

**Service Interval:** After the first 75 hours—Change the hydraulic-system filters and fluid.

Every 250 hours—After the initial change—change the hydraulic-system filters and fluid when using Mobil 1 15W50 fluid. (Change it more often under dirty or dusty conditions)

Every 500 hours—After the initial change—change the hydraulic-system filters and fluid when using Toro® HYPR-OIL™ 500 fluid. (Change it more often under dirty or dusty conditions)

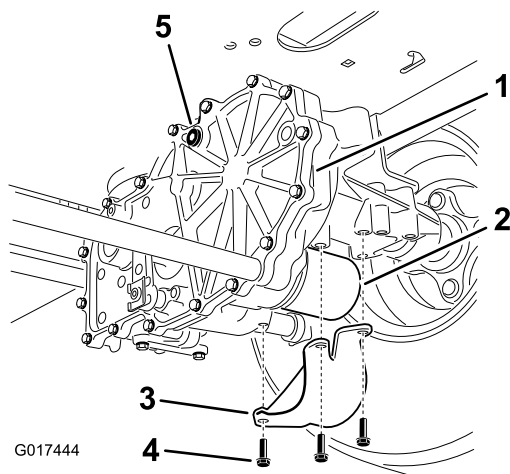
To replace the hydraulic fluid, the filters need to be removed. Replace both at the same time; refer to [Hydraulic Fluid Specifications \(page 63\)](#) for fluid specifications.

Purge any air in the system after you install the new filters and add fluid. Refer to [Bleeding the Hydraulic System \(page 65\)](#). Repeat the bleeding process until the fluid remains at the FULL COLD line in the reservoir after purging. **Failure to properly perform this procedure can result in irreparable damage to the transaxle drive system.**

## Removing Hydraulic-System Filters

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.

2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Allow the engine to cool.
4. Locate the filter and guards on each transaxle-drive system (Figure 84).
5. Remove the 3 screws securing the filter guard and guard (Figure 84).



**Figure 84**  
Right side shown

- |                    |              |
|--------------------|--------------|
| 1. Transaxle drive | 4. Screws    |
| 2. Filter          | 5. Vent plug |
| 3. Filter guard    |              |

4. Install the filter guards over each filter that you previously removed.
5. Use the 3 screws to secure the filter guards.
6. Verify that the vent plugs are removed before adding the fluid.
7. Slowly pour the specified fluid through the expansion reservoir until fluid comes out of 1 of the vent-plug holes.
8. Install the vent plug.
9. Torque the plug to 20 N·m (15 ft-lb).
10. Continue to add fluid through the expansion reservoir until fluid comes out of the remaining vent-plug hole on the second transmission.
11. Install the opposite vent plug.
12. Torque the plug to 20 N·m (15 ft-lb).
13. Continue to add fluid through the expansion reservoir until it reaches the FULL COLD line on the expansion reservoir.
14. Proceed to [Bleeding the Hydraulic System \(page 65\)](#).

**Important:** Failure to perform the *Bleeding the Hydraulic System* procedure after changing hydraulic filters and fluid can result in irreparable damage to the transaxle drive system.

6. Carefully clean the area around the filters.

**Important:** Do not allow dirt to enter the hydraulic system, or contamination may occur.

7. Place a drain pan below the filter to catch the fluid that drains when the filter and vent plugs are removed.
8. Locate and remove the vent plug on each transmission
9. Unscrew the filter to remove it, and allow the fluid to drain from the drive system.
10. Repeat this procedure for both filters.

## Installing the Hydraulic-System Filters

1. Apply a thin coat of hydraulic fluid on the surface of the rubber seal of each filter.
2. Turn the filter clockwise until the rubber seal contacts the filter adapter, then tighten the filter an additional 3/4 to 1 full turn.
3. Repeat for the opposite filter.



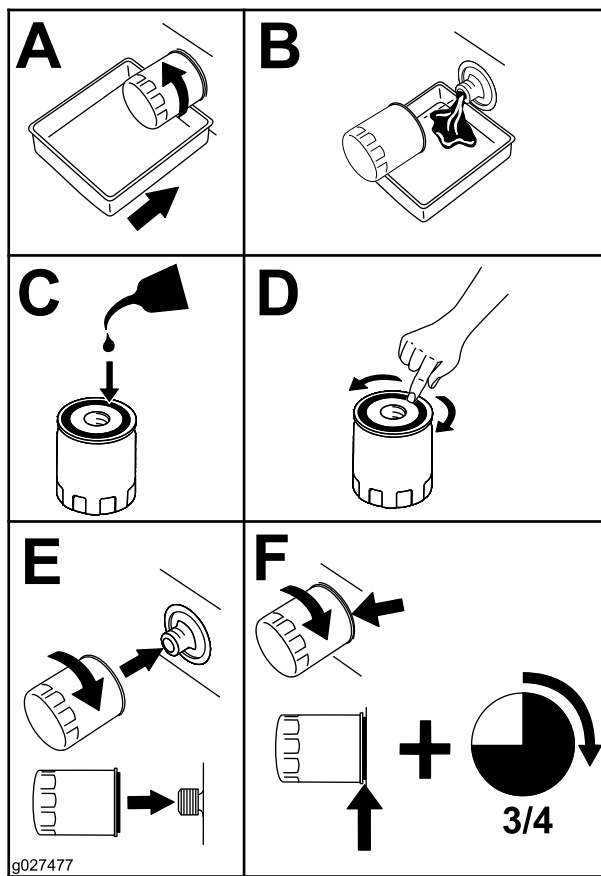


Figure 85

2. Start the engine, move the throttle control ahead to the 1/2 throttle position, and disengage the parking brake.
  - A. Move the bypass levers into the pushing the machine position. With the bypass valves open and the engine running, slowly move the motion-control levers in both forward and reverse 5 or 6 times.
  - B. Move the bypass levers into the operating the machine position.
  - C. With the bypass valve closed and the engine running, slowly move the control lever in both forward and reverse directions 5 to 6 times.
  - D. Shut off the engine and check the fluid level in the expansion reservoir. Add the specified fluid until it reaches the FULL COLD line on the expansion reservoir.
3. Repeat step 2 until all the air is completely purged from the system.
 

**Note:** When the transaxle operates at normal noise levels, moves smoothly forward, and reverses at normal speeds, it is purged.
4. Check the fluid level in the expansion reservoir a final time. Add the specified fluid as until it reaches the FULL COLD line on the expansion reservoir.

## Bleeding the Hydraulic System

1. Raise the rear of machine and support it with jack stands (or equivalent support) just high enough to allow the drive wheels to turn freely.

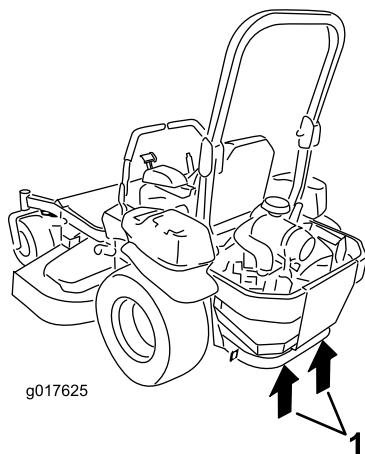


Figure 86

1. Jacking points

# Mower Deck Maintenance

## Blade Safety

A worn or damaged blade can break, and a piece of the blade could be thrown toward you or bystanders, resulting in serious personal injury or death. Trying to repair a damaged blade may result in discontinued safety certification of the product.

- Inspect the blades periodically for wear or damage.
- Use care when checking the blades. Wrap the blades or wear gloves, and use caution when servicing the blades. Only replace or sharpen the blades; never straighten or weld them.
- On multi-bladed machines, take care as rotating 1 blade can cause other blades to rotate.

## Servicing the Cutting Blades

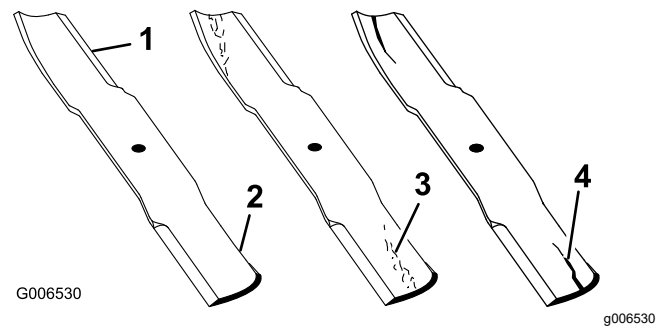
### Before Inspecting or Servicing the Blades

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and disconnect the spark-plug wires from the spark plugs.

### Inspecting the Blades

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

1. Inspect the cutting edges ([Figure 87](#)).
2. If the edges are not sharp or have nicks, remove and sharpen the blade; refer to [Sharpening the Blades](#) ([page 68](#)).
3. Inspect the blades, especially in the curved area.
4. If you notice any cracks, wear, or a slot forming in this area, immediately install a new blade ([Figure 87](#)).



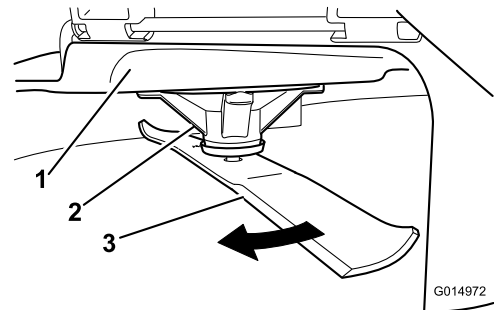
**Figure 87**

- |                 |                      |
|-----------------|----------------------|
| 1. Cutting edge | 3. Wear/slot forming |
| 2. Curved area  | 4. Crack             |

## Checking for Bent Blades

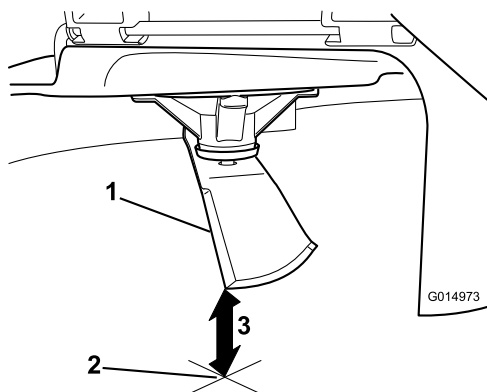
**Note:** The machine must be on a level surface for the following procedure.

1. Raise the mower deck to the highest height-of-cut position.
2. While wearing thickly padded gloves, or other adequate hand protection, slowly rotate the blade into a position that allows you to measure the distance between the cutting edge and the level surface the machine is on ([Figure 88](#)).



**Figure 88**

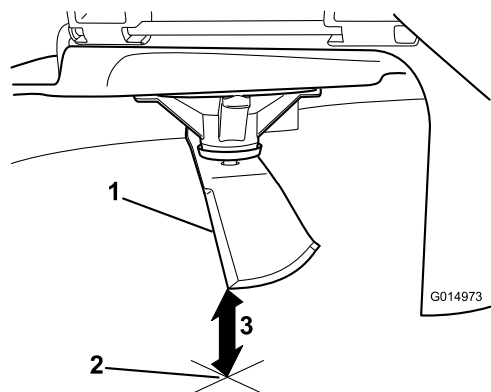
- |                    |          |
|--------------------|----------|
| 1. Deck            | 3. Blade |
| 2. Spindle housing |          |
3. Measure from the tip of the blade to the flat surface ([Figure 89](#)).



**Figure 89**

1. Blade (in position for measuring)
2. Level surface
3. Measured distance between blade and the surface (A)

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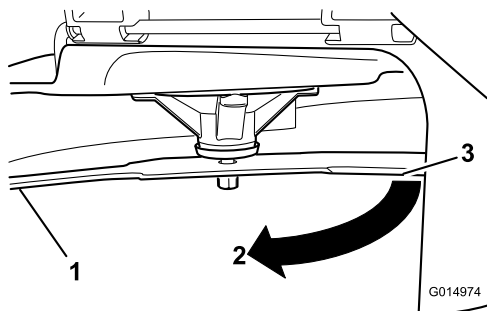


**Figure 91**

1. Opposite blade edge (in position for measuring)
2. Level surface
3. Second measured distance between blade and surface (B)

g014973

4. Rotate the same blade 180 degrees so that the opposing cutting edge is now in the same position ([Figure 90](#)).



**Figure 90**

1. Blade (side previously measured)
2. Measurement (position used previously)
3. Opposing side of blade being moved into measurement position

g014974

5. Measure from the tip of the blade to the flat surface ([Figure 91](#)).

**Note:** The variance should be no more than 3 mm (1/8 inch).

- A. If the difference between A and B is greater than 3 mm (1/8 inch), replace the blade with a new blade; refer to [Removing the Blades \(page 67\)](#) and [Installing the Blades \(page 68\)](#).

**Note:** If a bent blade is replaced with a new blade, and the dimension obtained continues to exceed 3 mm (1/8 inch), the blade spindle could be bent. Contact an Authorized Service Dealer for service.

- B. If the variance is within constraints, move to the next blade.

6. Repeat this procedure on each blade.

## Removing the Blades

Replace the blades if they hit a solid object, or if the blade is out of balance or bent.

1. Hold the spindle shaft with a wrench.
2. Remove the blade bolt, curved washer, and blade from the spindle shaft ([Figure 92](#)).

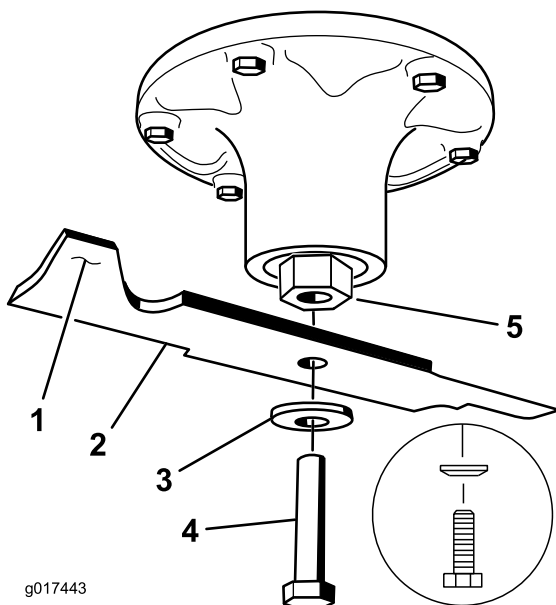


Figure 92

- |                           |                  |
|---------------------------|------------------|
| 1. Sail area of the blade | 4. Blade bolt    |
| 2. Blade                  | 5. Spindle shaft |
| 3. Curved washer          |                  |

## Sharpening the Blades

1. Use a file to sharpen the cutting edge at both ends of the blade (Figure 93).

**Note:** Maintain the original angle.

**Note:** The blade retains its balance if the same amount of material is removed from both cutting edges.

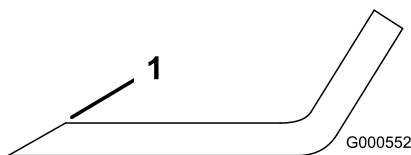


Figure 93

1. Sharpen at original angle.
2. Check the balance of the blade by putting it on a blade balancer (Figure 94).

**Note:** If the blade stays in a horizontal position, the blade is balanced and can be used.

**Note:** If the blade is not balanced, file some metal off the end of the sail area only (Figure 93).

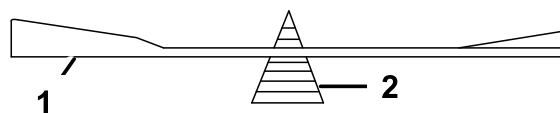


Figure 94

1. Blade
2. Balancer

3. Repeat this procedure until the blade is balanced.

## Installing the Blades

1. Install the blade onto the spindle shaft (Figure 92).

**Important:** The curved part of the blade must point upward toward the inside of the mower to ensure proper cutting.

2. Install the curved washer and blade bolt (Figure 92).

**Note:** Install the curved-washer cone toward the bolt head.

3. Torque the blade bolt to 115 to 150 N·m (85 to 110 ft·lb).

## Adjusting the Side-to-Side Leveling and the Blade Slope

Check to ensure that the mower deck is level any time you install the mower or when you see an uneven cut on your lawn.

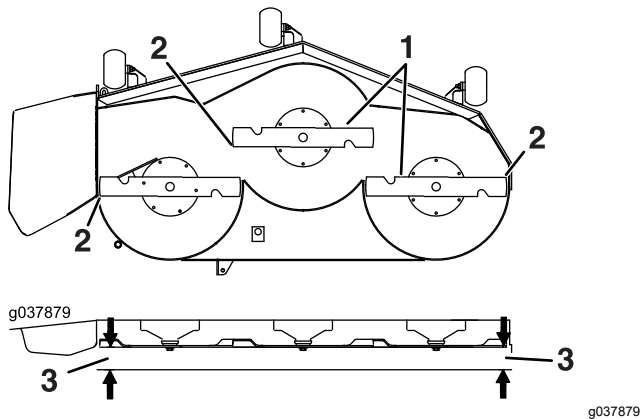
Check the mower deck for bent blades prior to leveling, and remove and replace any bent blades; refer to [Checking for Bent Blades \(page 66\)](#) before continuing.

Level the mower deck side-to-side first; then you can adjust the front-to-rear slope.

### Requirements:

- The machine must be on a level surface.
  - All tires must be properly inflated; refer to [Checking the Tire Pressure \(page 56\)](#).
1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
  2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
  3. Check the tire pressure in the drive tires; refer to [Checking the Tire Pressure \(page 56\)](#).

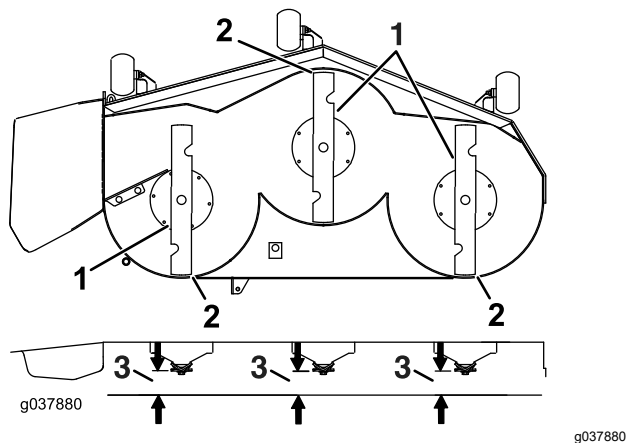
4. Position the mower deck in the transport-lock position.
5. Carefully rotate the blades from side to side.
6. Measure between the blade tip and the flat surface (Figure 95). If both measurements are not within 5 mm (3/16 inch), adjust the leveling; continue with this procedure.



**Figure 95**

1. Blades side to side
2. Blade tip
3. Measure from the tip of the blade to the flat surface here.

7. Check the front-to-rear blade level (Figure 96). Ensure the front blade tip is lower than the rear blade tip as shown in the block height and rake table. If adjustment is needed, continue with this procedure.



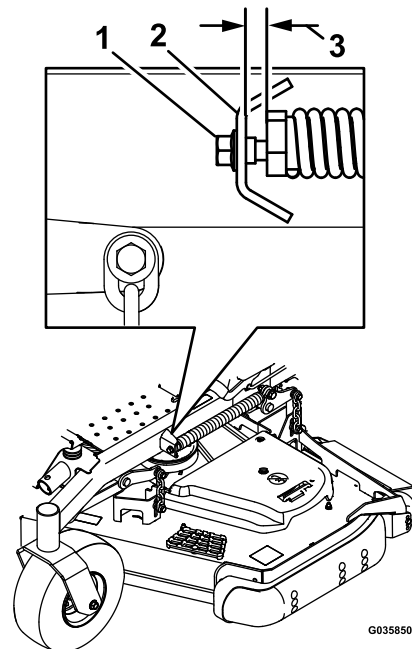
**Figure 96**

1. Blades front to rear
2. Blade tip
3. Measure from the tip of the blade to the flat surface here.

8. Set the anti-scalp rollers to top holes or remove them completely for this adjustment.
9. For 60-inch mower decks only:

- A. Raise the deck to the transport position (12.7 cm or 5 inches).
- B. Slowly loosen the adjusting screw on the lift-assist spring until you can remove the screw (see Figure 97).

**Note:** Save the screw for installation.

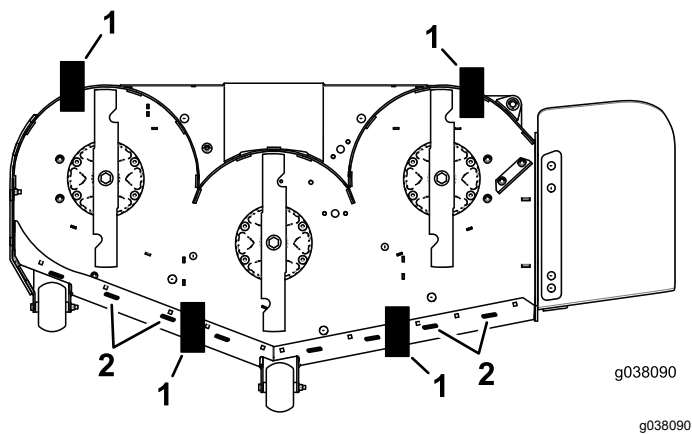


**Figure 97**

Rear discharge mower deck shown

1. Adjusting screw
2. Bracket
3. Set the gap to 22 to 29 mm (7/8 to 1-1/8 inch).

10. Place 2 blocks (see Block Height and Rake Table) under the rear edge of the cutting deck skirt; 1 on each side of the cutting deck (Figure 98).
11. Set the height-of-cut lever to the 3 inch (76 mm) position.
12. Place 2 blocks under each side of the front edge of the deck, but not under the anti-scalp roller brackets or welds.



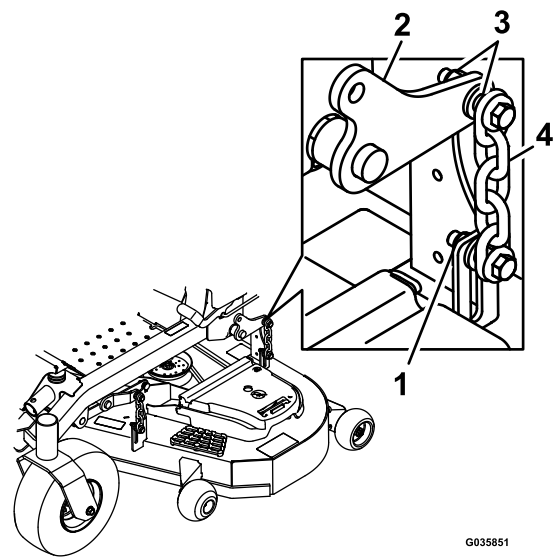
**Figure 98**  
Bottom view

1. Block—7.3 cm (2.87 inches)      2. Welds

### Block Height and Rake Table

Deck Size	Front Block Height	Rake
All mower decks	7.3 cm (2.87 inches)	4.8 to 6.4 mm (3/16 to 1/4 inch)

13. Carefully rotate the blades side to side ([Figure 95](#)).
14. Loosen the locknuts ([Figure 99](#)) on all 4 corners and ensure that the mower deck is sitting securely on all 4 blocks.
15. Remove any slack from the deck hangers and make sure the deck-lift foot lever is pushed back against the stop.
16. Tighten the 4 locknuts.



**Figure 99**

1. Locknuts      3. Deck hanger  
2. Deck lift arm      4. Chain

17. Ensure that the blocks fit snugly under the deck skirt and that all attachment bolts are tight
18. Continue leveling the deck by checking the front-to-rear blade slope.
19. Check the blades for levelness and repeat deck leveling procedure if necessary.
20. For 60-inch mower decks only:
  - A. Raise the deck to the transport position (12.7 cm or 5 inches).
  - B. Install the lift-assist spring adjusting screw previously removed in [step 9](#).
  - C. Set the gap between the spring and the bracket to 22 to 29 mm (7/8 to 1-1/8 inch).

# Removing the Mower Deck

Before servicing or removing the mower deck, lock out the spring-loaded deck arms.

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Place the height-adjustment pin in the 7.6 cm (3 inch) cutting-height location.
4. Remove the belt covers.
5. Loosen the mower deck idler and remove the mower belt; refer to [Belt Maintenance \(page 59\)](#).
6. Remove the bolts and nuts from the front of the plate under the footrest.
7. Remove and retain the bolts and nuts on both sides of the machine ([Figure 100](#)).

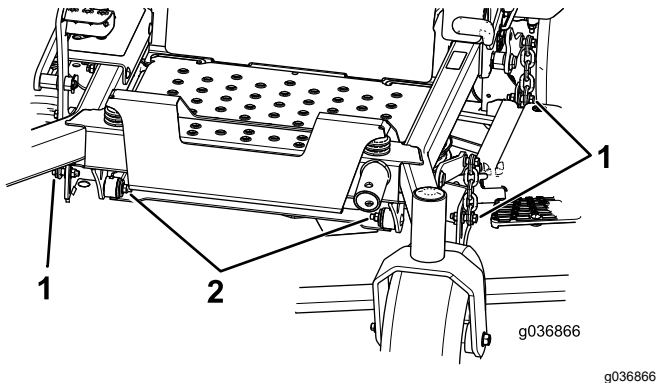


Figure 100

1. Remove the nuts and bolts here.
  2. Remove the nuts and bolts here.
- 
8. Slide the deck out to the right side of the machine.

# Replacing the Grass Deflector

## ⚠ WARNING

**An uncovered discharge opening could allow the machine to throw objects toward you or bystanders, resulting in serious injury. Also, contact with the blade could occur.**

**Never operate the machine unless you install a mulch plate, discharge deflector, or grass collection system.**

1. Remove the locknut, bolt, spring, and spacer holding the deflector to the pivot brackets ([Figure 101](#)).
2. Remove the damaged or worn grass deflector ([Figure 101](#)).

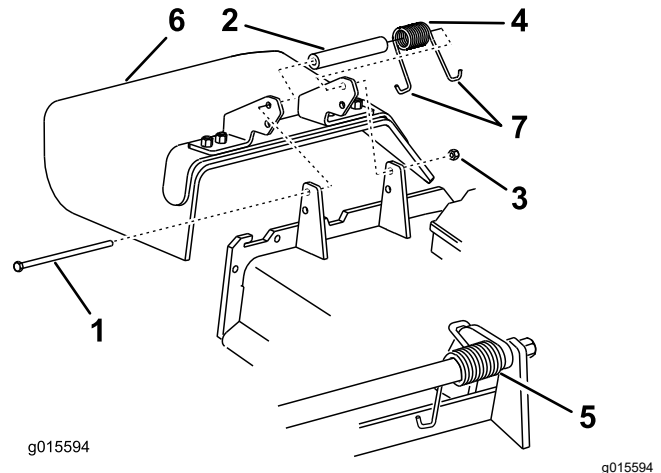


Figure 101

- |            |                         |
|------------|-------------------------|
| 1. Bolt    | 5. Spring installed     |
| 2. Spacer  | 6. Grass deflector      |
| 3. Locknut | 7. J-hook end of spring |
| 4. Spring  |                         |
- 

3. Place the spacer and the spring onto grass deflector.
4. Place 1 J-hook end of the spring behind the deck edge.

**Note:** Make sure that 1 J-hook end of the spring is installed behind the deck edge before installing the bolt as shown in [Figure 101](#).

5. Install the bolt and the nut.
6. Place 1 J-hook end of the spring around the grass deflector ([Figure 101](#)).

**Important:** The grass deflector must be able to rotate. Lift the deflector up to the full open position and ensure that it rotates into the full down position.

# Cleaning

## Cleaning under the Mower Deck

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

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Raise the mower deck to the TRANSPORT position.

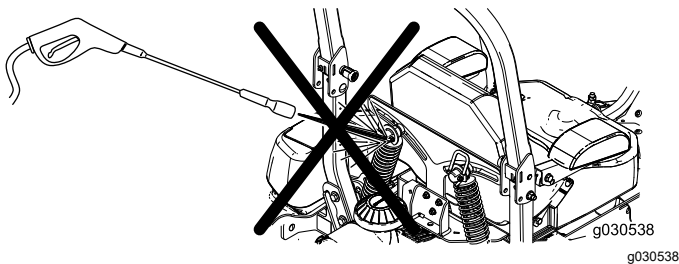
## Cleaning the Suspension System

### Machines with MyRide™ Suspension System Only

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

Use compressed air to clean the suspension system.

**Note:** Do not clean the shock assemblies with pressurized water ([Figure 102](#)).



**Figure 102**

---

## Disposing of Waste

Engine oil, batteries, hydraulic fluid, and engine coolant are pollutants to the environment. Dispose of these according to your state and local regulations.



# Storage

## Storage Safety

- Shut off the engine, remove the key, wait for all moving parts to stop, and allow the machine to cool before storing it.
- Do not store the machine or fuel near flames or drain the fuel indoors.
- Remove the key and store it in a safe place out of the reach of children.

## Cleaning and Storage

1. Disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Remove grass clippings, dirt, and grime from the external parts of the entire machine, especially the engine and hydraulic system. Clean dirt and chaff from the outside of the engine cylinder head fins and blower housing.

**Important:** You can wash the machine with mild detergent and water. Do not pressure wash the machine. Avoid excessive use of water, especially near the control panel, engine, hydraulic pumps, and motors.

4. Check the parking brake operation; refer to [Adjusting the Parking Brake \(page 57\)](#).
5. Service the air cleaner; refer to [Servicing the Air Cleaner \(page 41\)](#).
6. Grease the machine; refer to [Lubrication \(page 39\)](#).
7. Change the crankcase oil; refer to [Servicing the Engine Oil \(page 43\)](#).
8. Check the tire pressure; refer to [Checking the Tire Pressure \(page 56\)](#).
9. Change the hydraulic filters; refer to [Changing the Hydraulic Fluid and Filters \(page 63\)](#).
10. Charge the battery; refer to [Charging the Battery \(page 53\)](#).
11. Scrape any heavy buildup of grass and dirt from the underside of the mower, then wash the mower with a garden hose.

**Note:** Run the machine with the blade-control switch (PTO) engaged and the engine at high idle for 2 to 5 minutes after washing.

12. Check the condition of the blades; refer to [Servicing the Cutting Blades \(page 66\)](#).

13. Prepare the machine for storage when non-use occurs over 30 days. Prepare the machine for storage as follows:

- A. Add a petroleum-based stabilizer/conditioner to fuel in the tank. Follow mixing instructions from the stabilizer manufacturer. Do not use an alcohol-based stabilizer (ethanol or methanol).  
**Note:** A fuel stabilizer/conditioner is most effective when mixed with fresh fuel and used at all times.
- B. Run the engine to distribute conditioned fuel through the fuel system for 5 minutes.
- C. Shut off the engine, allow it to cool, and drain the fuel tank.
- D. Start the engine and run it until it stops.
- E. Dispose of fuel properly. Recycle the fuel according to local codes.

**Important:** Do not store fuel containing stabilizer/conditioner longer than the duration recommended by the fuel-stabilizer manufacturer.

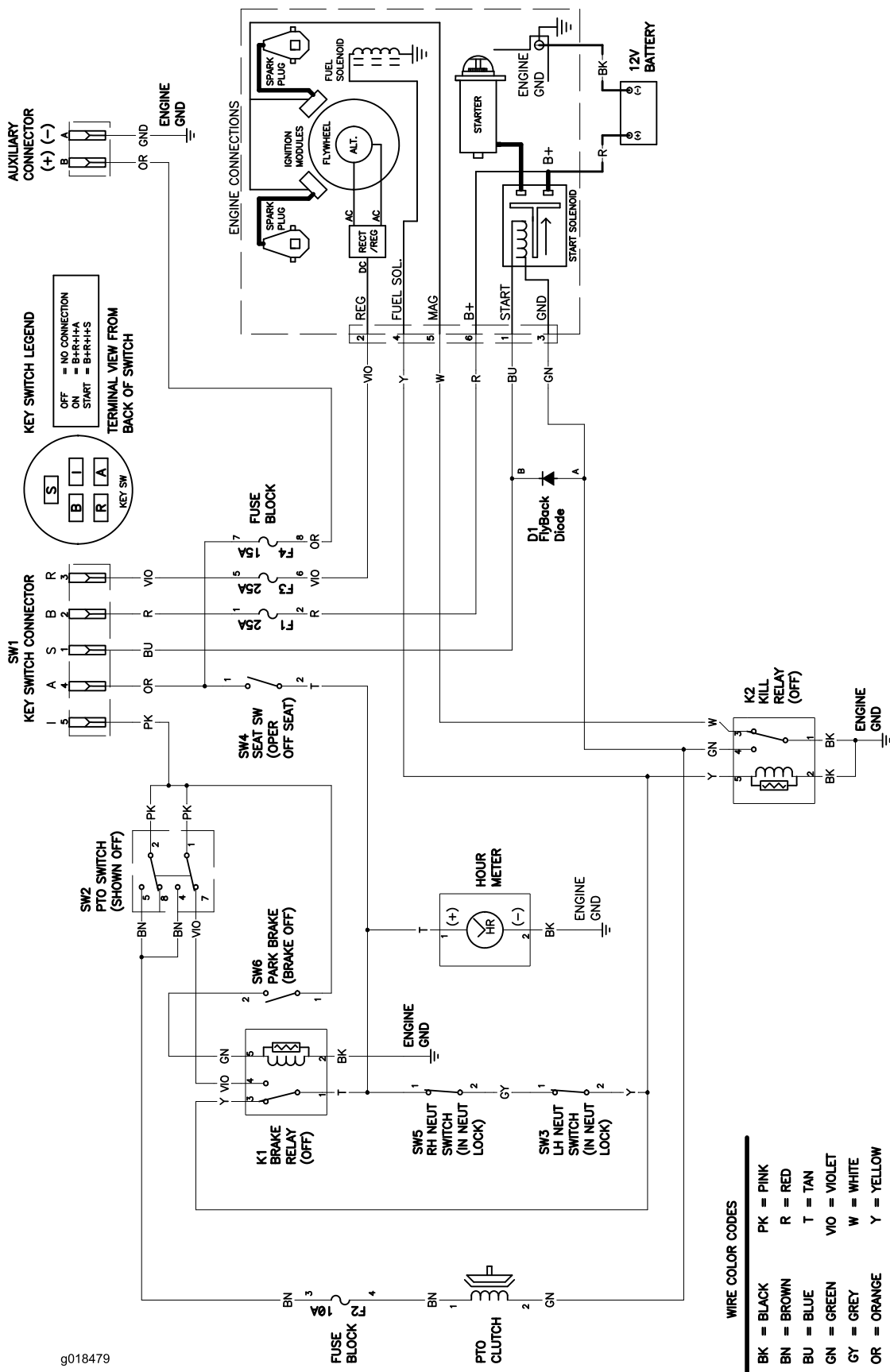
14. Remove and check the condition of the spark plug(s); refer to [Servicing the Spark Plug\(s\) \(page 45\)](#). With the spark plug(s) removed from the engine, pour 30 ml (2 tablespoons) of engine oil into the spark plug hole. Use the starter to crank the engine and distribute the oil inside the cylinder. Install the spark plug(s). Do not install the wire on the spark plug(s).
15. Check and tighten all bolts, nuts, and screws. Repair or replace any part that is damaged.
16. Paint all scratched or bare metal surfaces. Paint is available from your Authorized Service Dealer.
17. Store the machine in a clean, dry garage or storage area. Remove the key from the switch and keep it out of reach of children or other unauthorized users. Cover the machine to protect it and keep it clean.

# Troubleshooting

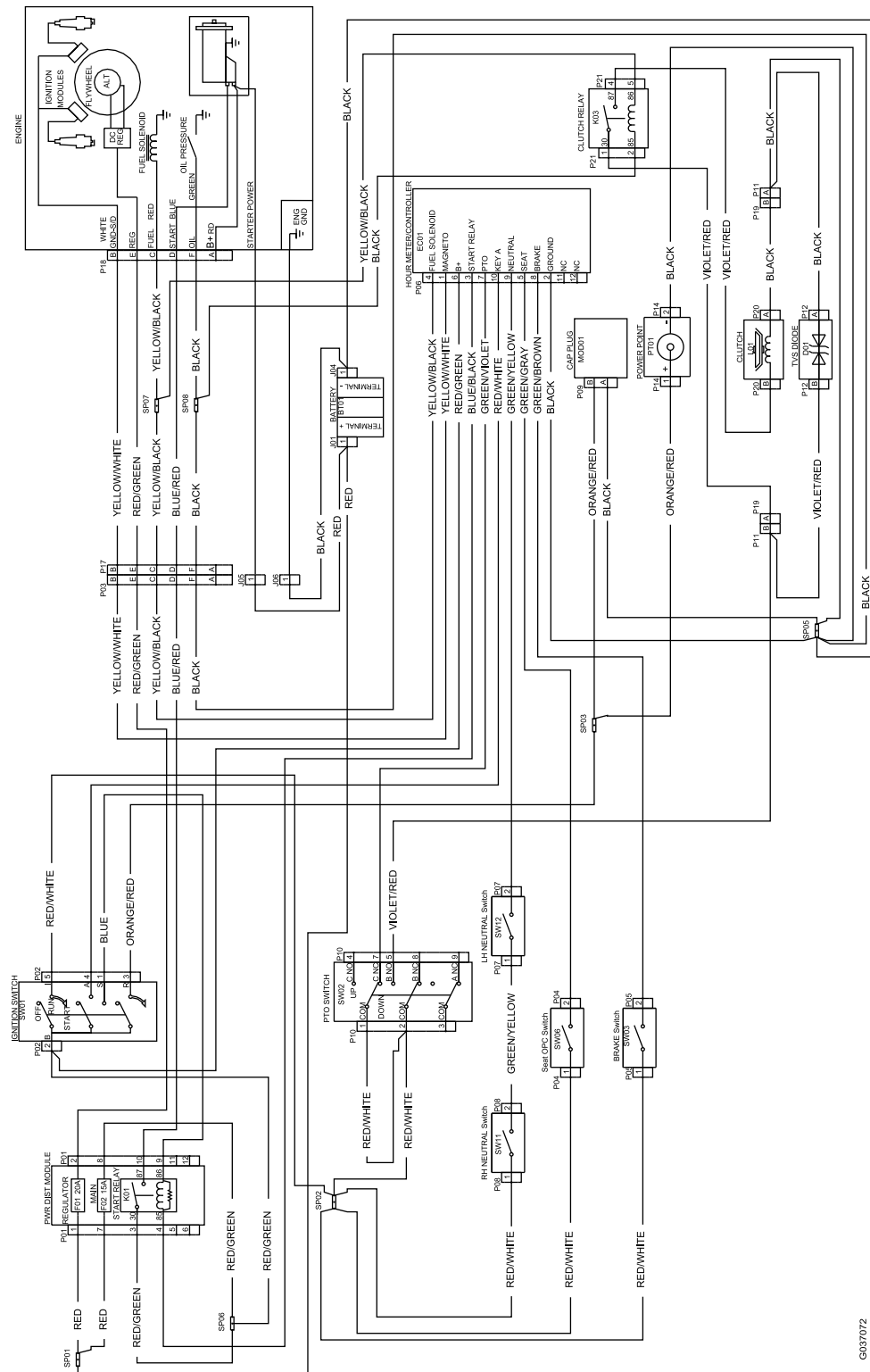
Problem	Possible Cause	Corrective Action
The engine overheats.	<ol style="list-style-type: none"> <li>1. The engine load is excessive.</li> <li>2. The oil level in the crankcase is low.</li> <li>3. The cooling fins and air passages under the engine-blower housing are plugged.</li> <li>4. The air cleaner is dirty.</li> <li>5. Dirt, water, or stale fuel is in the fuel system.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce the ground speed.</li> <li>2. Add oil to the crankcase.</li> <li>3. Remove the obstruction from the cooling fins and air passages.</li> <li>4. Clean or replace the air-cleaner element.</li> <li>5. Contact an Authorized Service Dealer</li> </ol>
The starter does not crank.	<ol style="list-style-type: none"> <li>1. The blade-control switch is engaged.</li> <li>2. The motion-control levers are not in the NEUTRAL-LOCK position.</li> <li>3. The battery is dead.</li> <li>4. The electrical connections are corroded or loose.</li> <li>5. A fuse is blown.</li> <li>6. A relay or switch is damaged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Disengage the blade-control switch.</li> <li>2. Move the motion-control levers outward to the NEUTRAL-LOCK position.</li> <li>3. Charge the battery.</li> <li>4. Check the electrical connections for good contact.</li> <li>5. Replace the fuse.</li> <li>6. Contact an Authorized Service Dealer.</li> </ol>
The engine does not start, starts hard, or fails to keep running.	<ol style="list-style-type: none"> <li>1. The fuel tank is empty.</li> <li>2. The fuel-shutoff valve is closed.</li> <li>3. The oil level in the crankcase is low.</li> <li>4. The throttle is not in the correct position.</li> <li>5. There is dirt in the fuel filter.</li> <li>6. Dirt, water, or stale fuel is in fuel system.</li> <li>7. The air cleaner is dirty.</li> <li>8. The seat switch is not functioning properly.</li> <li>9. The electrical connections are corroded, loose, or damaged.</li> <li>10. The relay or switch is worn or damaged.</li> <li>11. The spark plug is fouled or improperly gapped.</li> <li>12. The spark-plug wire is not connected.</li> </ol>	<ol style="list-style-type: none"> <li>1. Fill the fuel tank.</li> <li>2. Open the fuel-shutoff valve.</li> <li>3. Add oil to the crankcase.</li> <li>4. Be sure that the throttle control is midway between the slow and fast positions.</li> <li>5. Replace the fuel filter.</li> <li>6. Contact an Authorized Service Dealer.</li> <li>7. Clean or replace the air-cleaner element.</li> <li>8. Check the seat-switch indicator. Replace the seat if necessary.</li> <li>9. Check the electrical connections for good contact. Clean the connector terminals thoroughly with electrical-contact cleaner, apply dielectric grease, and make the appropriate connections.</li> <li>10. Contact an Authorized Service Dealer.</li> <li>11. Adjust or replace the spark plug.</li> <li>12. Check the spark-plug wire connection.</li> </ol>
The engine loses power.	<ol style="list-style-type: none"> <li>1. The engine load is excessive.</li> <li>2. The air cleaner is dirty.</li> <li>3. The oil level in the crankcase is low.</li> <li>4. The cooling fins and the air passages above the engine are plugged.</li> <li>5. The vent hole in the fuel cap is plugged.</li> <li>6. There is dirt in the fuel filter.</li> <li>7. There is dirt, water, or stale fuel in the fuel system.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce the ground speed.</li> <li>2. Clean the air-cleaner element.</li> <li>3. Add oil to the crankcase.</li> <li>4. Remove the obstruction from the cooling fins and the air passages.</li> <li>5. Clean or replace the fuel cap.</li> <li>6. Replace the fuel filter.</li> <li>7. Contact an Authorized Service Dealer.</li> </ol>
The mower pulls to the left or right (with levers fully forward)	<ol style="list-style-type: none"> <li>1. The tracking needs adjustment</li> <li>2. The tire pressure in the drive tires is not correct.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust the tracking.</li> <li>2. Adjust the tire pressure in the drive tires.</li> </ol>

<b>Problem</b>	<b>Possible Cause</b>	<b>Corrective Action</b>
The machine does not drive.	<ol style="list-style-type: none"> <li>1. The bypass valves are not closed tight.</li> <li>2. The pump belt is worn, loose, or broken.</li> <li>3. The pump belt is off a pulley.</li> <li>4. The idler spring is broken or missing.</li> <li>5. The hydraulic fluid level is low or too hot.</li> </ol>	<ol style="list-style-type: none"> <li>1. Tighten the bypass valves.</li> <li>2. Change the belt.</li> <li>3. Change the belt.</li> <li>4. Replace the spring.</li> <li>5. Add hydraulic fluid to the reservoirs or let it cool down.</li> </ol>
The machine vibrates abnormally.	<ol style="list-style-type: none"> <li>1. The cutting blade(s) is/are bent or unbalanced.</li> <li>2. The blade mounting bolt is loose.</li> <li>3. The engine mounting bolts are loose.</li> <li>4. The engine pulley, idler pulley, or blade pulley is loose.</li> <li>5. The engine pulley is damaged.</li> <li>6. The blade spindle is bent.</li> <li>7. The motor mount is loose or worn.</li> </ol>	<ol style="list-style-type: none"> <li>1. Install new cutting blade(s).</li> <li>2. Tighten the blade mounting bolt.</li> <li>3. Tighten the engine mounting bolts.</li> <li>4. Tighten the appropriate pulley.</li> <li>5. Contact an Authorized Service Dealer.</li> <li>6. Contact an Authorized Service Dealer.</li> <li>7. Contact an Authorized Service Dealer.</li> </ol>
The cutting height is uneven.	<ol style="list-style-type: none"> <li>1. The blade(s) is not sharp.</li> <li>2. A cutting blade(s) is/are bent.</li> <li>3. The mower is not level.</li> <li>4. An anti-scalp roller (if applicable) is not set correctly.</li> <li>5. The underside of the mower deck is dirty.</li> <li>6. The tire pressure is incorrect.</li> <li>7. A blade spindle is bent.</li> </ol>	<ol style="list-style-type: none"> <li>1. Sharpen the blade(s).</li> <li>2. Install a new cutting blade(s).</li> <li>3. Level the mower from side-to-side and front-to-rear.</li> <li>4. Adjust the anti-scalp wheel height.</li> <li>5. Clean the underside of the mower deck.</li> <li>6. Adjust the tire pressure.</li> <li>7. Contact an Authorized Service Dealer.</li> </ol>
The blades do not rotate.	<ol style="list-style-type: none"> <li>1. The drive belt is worn, loose or broken.</li> <li>2. The drive belt is off of the pulley.</li> <li>3. The power takeoff (PTO) switch or PTO clutch is faulty.</li> <li>4. The mower belt is worn, loose, or broken.</li> </ol>	<ol style="list-style-type: none"> <li>1. Install a new drive belt.</li> <li>2. Install the drive belt and check the adjusting shafts and belt guides for the correct position.</li> <li>3. Contact an Authorized Service Dealer.</li> <li>4. Install a new mower belt.</li> </ol>
The clutch does not engage.	<ol style="list-style-type: none"> <li>1. The fuse is blown.</li> <li>2. There is low voltage supply at the clutch.</li> <li>3. The coil is damaged.</li> <li>4. There is inadequate current supply.</li> <li>5. The rotor/armature air gap is too large.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace the fuse. Check the coil resistance, battery charge, charging system, and wiring connections, and replace components if necessary.</li> <li>2. Check the coil resistance, battery charge, charging system, and wiring connections and replace parts if necessary.</li> <li>3. Replace the clutch.</li> <li>4. Repair or replace the clutch lead wire or electrical system. Clean the connector contacts.</li> <li>5. Remove the shim or replace the clutch.</li> </ol>

# Schematics



## Wire Diagram—Toro Engines (Rev. A)



Wire Diagram—Kawasaki Engines (Rev. A)

G037072

G037072

**Notes:**

# California Proposition 65 Warning Information

## What is this warning?

You may see a product for sale that has a warning label like the following:



**WARNING: Cancer and Reproductive Harm—**[www.p65Warnings.ca.gov](http://www.p65Warnings.ca.gov).

## What is Prop 65?

Prop 65 applies to any company operating in California, selling products in California, or manufacturing products that may be sold in or brought into California. It mandates that the Governor of California maintain and publish a list of chemicals known to cause cancer, birth defects, and/or other reproductive harm. The list, which is updated annually, includes hundreds of chemicals found in many everyday items. The purpose of Prop 65 is to inform the public about exposure to these chemicals.

Prop 65 does not ban the sale of products containing these chemicals but instead requires warnings on any product, product packaging, or literature with the product. Moreover, a Prop 65 warning does not mean that a product is in violation of any product safety standards or requirements. In fact, the California government has clarified that a Prop 65 warning "is not the same as a regulatory decision that a product is 'safe' or 'unsafe.'" Many of these chemicals have been used in everyday products for years without documented harm. For more information, go to <https://oag.ca.gov/prop65/faqs-view-all>.

A Prop 65 warning means that a company has either (1) evaluated the exposure and has concluded that it exceeds the "no significant risk level"; or (2) has chosen to provide a warning based on its understanding about the presence of a listed chemical without attempting to evaluate the exposure.

## Does this law apply everywhere?

Prop 65 warnings are required under California law only. These warnings are seen throughout California in a wide range of settings, including but not limited to restaurants, grocery stores, hotels, schools, and hospitals, and on a wide variety of products. Additionally, some online and mail order retailers provide Prop 65 warnings on their websites or in catalogs.

## How do the California warnings compare to federal limits?

Prop 65 standards are often more stringent than federal and international standards. There are various substances that require a Prop 65 warning at levels that are far lower than federal action limits. For example, the Prop 65 standard for warnings for lead is 0.5 µg/day, which is well below the federal and international standards.

## Why don't all similar products carry the warning?

- Products sold in California require Prop 65 labelling while similar products sold elsewhere do not.
- A company involved in a Prop 65 lawsuit reaching a settlement may be required to use Prop 65 warnings for its products, but other companies making similar products may have no such requirement.
- The enforcement of Prop 65 is inconsistent.
- Companies may elect not to provide warnings because they conclude that they are not required to do so under Prop 65; a lack of warnings for a product does not mean that the product is free of listed chemicals at similar levels.

## Why does Toro include this warning?

Toro has chosen to provide consumers with as much information as possible so that they can make informed decisions about the products they buy and use. Toro provides warnings in certain cases based on its knowledge of the presence of one or more listed chemicals without evaluating the level of exposure, as not all the listed chemicals provide exposure limit requirements. While the exposure from Toro products may be negligible or well within the "no significant risk" range, out of an abundance of caution, Toro has elected to provide the Prop 65 warnings. Moreover, if Toro does not provide these warnings, it could be sued by the State of California or by private parties seeking to enforce Prop 65 and subject to substantial penalties.



**Count on it.**