Form No. 3422-859 Rev E

TORO®

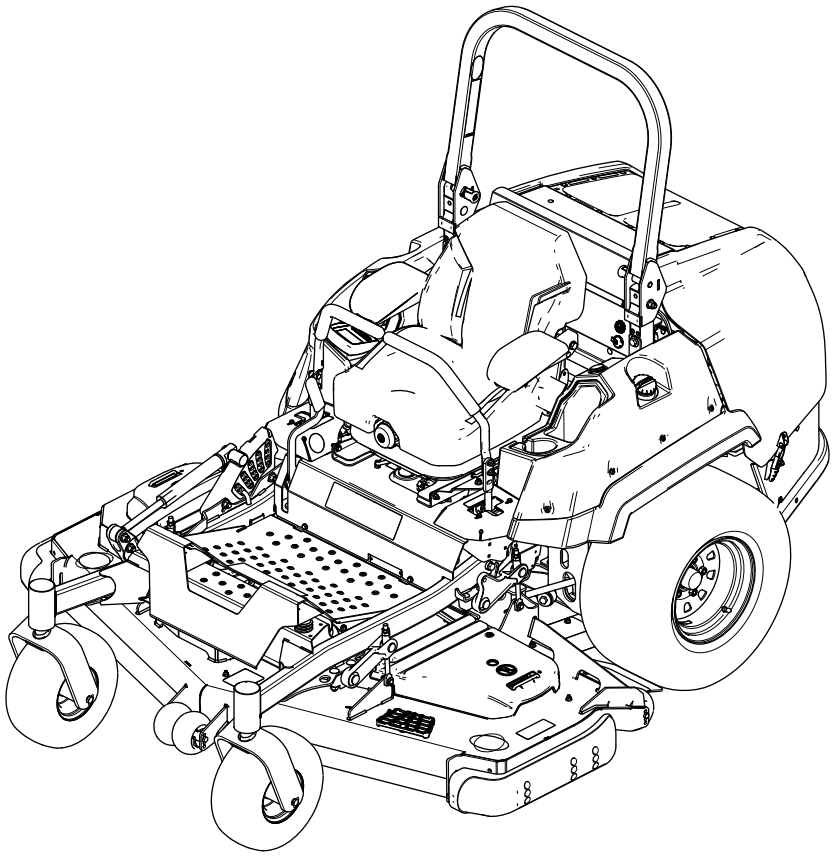
Count on it.

Operator's Manual

Z Master® Professional 7500-D Series Riding Mower

With 60in or 72in TURBO FORCE® Mower

Model No. 74060—Serial No. 400000000 and Up
Model No. 74064—Serial No. 400000000 and Up
Model No. 74072—Serial No. 400000000 and Up
Model No. 74074—Serial No. 400000000 and Up



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

3422-859

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:

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

Please refer to the engine manufacturer's information included with the machine.

⚠ WARNING

CALIFORNIA
Proposition 65 Warning

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

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

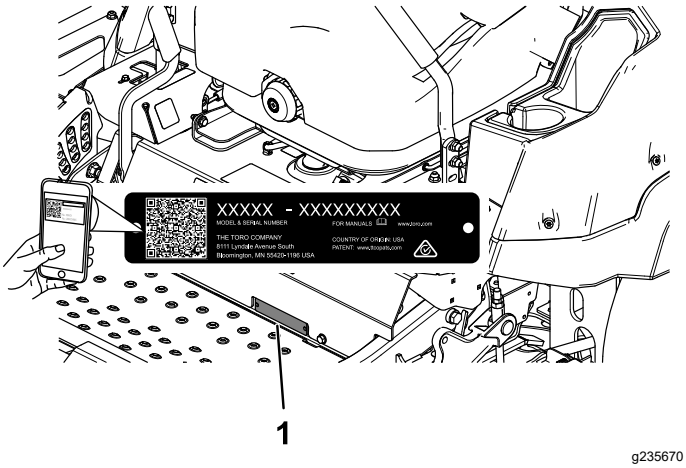
This rotary-blade, riding lawn mower is intended to be used by residential homeowners or professional, hired operators. It is designed primarily for cutting grass on well-maintained lawns on residential or commercial properties. It is not designed for cutting brush or for agricultural uses.

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

You may contact Toro directly at www.Toro.com for product 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 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 (if equipped) on the serial number decal to access warranty, parts, and other product information.**



g235670

Figure 1

1. Model and serial number location

Model No. _____

Serial No. _____

This manual identifies potential hazards and has safety messages identified by the safety-alert symbol (Figure 2), which signals a hazard that may cause

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Bloomington, MN 55420

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serious injury or death if you do not follow the recommended precautions.



g000502

Figure 2
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 B71.4-2012.

General Safety

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

Using this product for purposes other than its intended use could prove dangerous to you and bystanders.

- Always keep the roll bar in the fully raised and locked position and use the seat belt.
- Use your full attention while operating the machine. Do not engage in any activity that causes distractions; otherwise, injury or property damage may occur.
- Do not operate the machine near drop-offs, ditches, embankments, water, or other hazards, or on slopes greater than 15 degrees.
- Read and understand the contents of this *Operator's Manual* before starting the engine.
- Do not put your hands or feet near moving components of the machine.
- Do not operate the machine without all guards and other safety protective devices in place and working on the machine.
- Keep children and bystanders out of the operating area. Never allow children to operate the machine.
- Stop the machine, shut off the engine, and remove the key before servicing, fueling, or unclogging the machine.

Improperly using or maintaining this machine can result in injury. To reduce the potential for injury, comply with these safety instructions and always pay attention to the safety-alert symbol, which means Caution, Warning, or Danger—personal safety instruction. Failure to comply with these instructions may result in personal injury or death.

You can find additional safety information where needed throughout this manual.

Slope Indicator

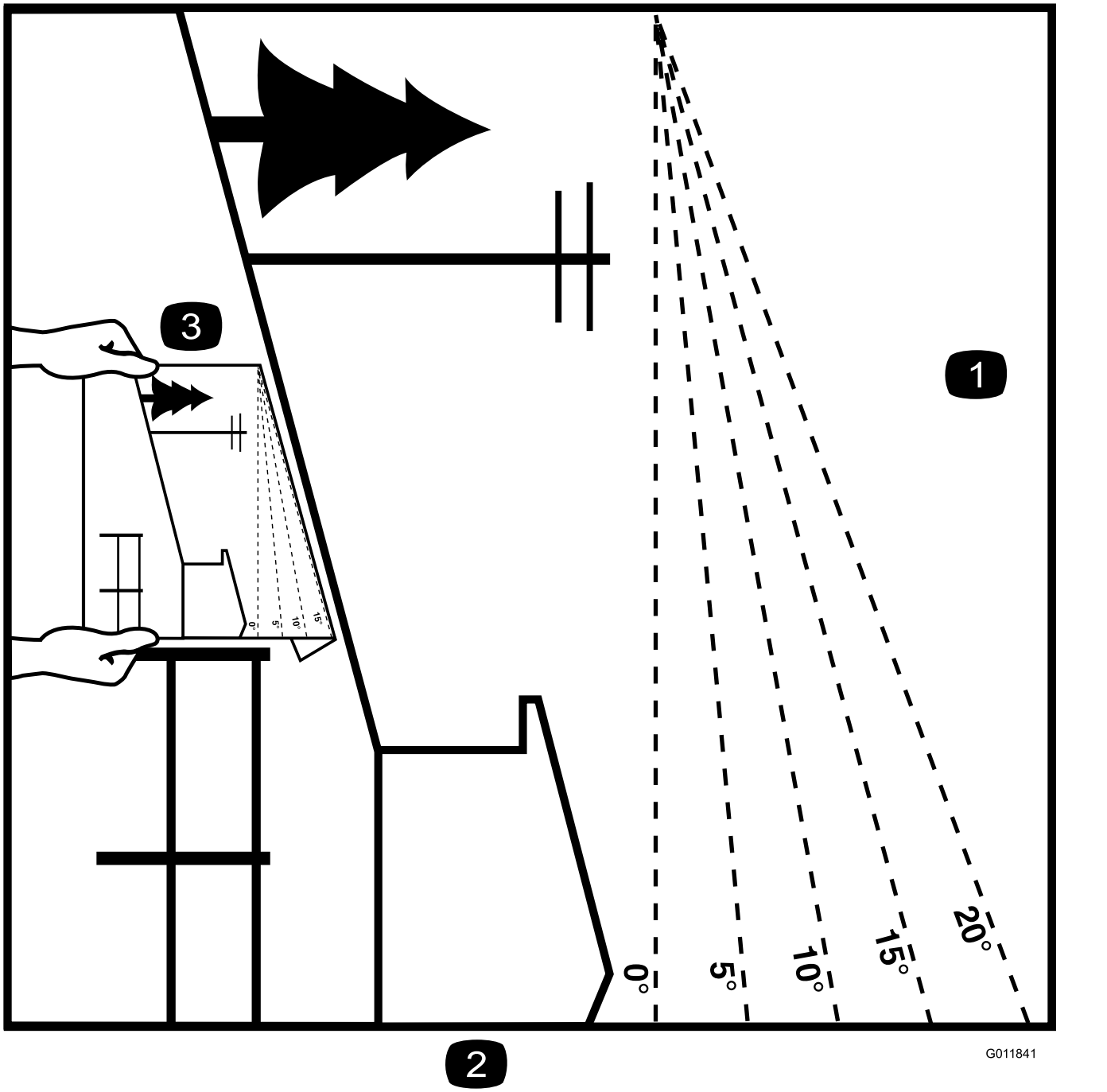


Figure 3

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.

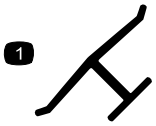


decalbatterysymbols

Battery Symbols

Some or all of these symbols are on your battery.

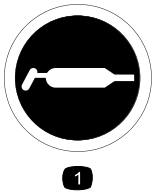
1. Explosion hazard
2. No fire, open flame, or smoking
3. Caustic liquid/chemical burn hazard
4. Wear eye protection.
5. Read the *Operator's Manual*.
6. Keep bystanders away from the battery.
7. Wear eye protection; explosive gases can cause blindness and other injuries.
8. Battery acid can cause blindness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



decaloemmarkt

Manufacturer's Mark

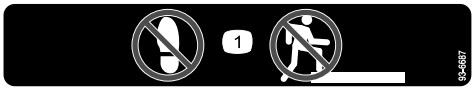
1. Indicates the blade is identified as a part from the original machine manufacturer.



decal58-6520

58-6520

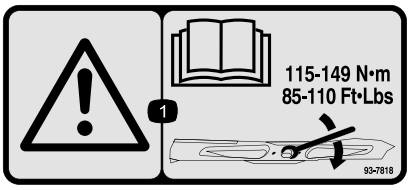
1. Grease



decal93-6687

93-6687

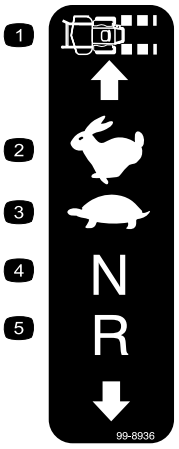
1. Do not step here.



decal93-7818

93-7818

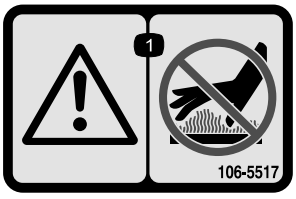
1. Warning—read the *Operator's Manual* for instructions on torquing the blade bolt/nut to 115 to 149 N·m (85 to 110 ft-lb).



decal99-8936

99-8936

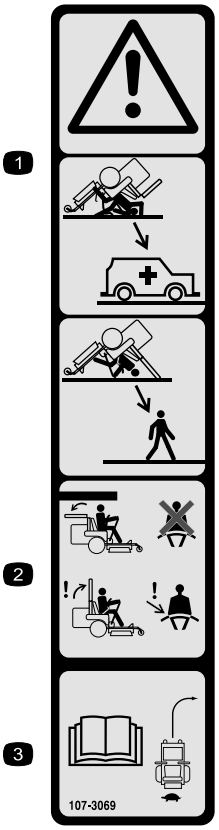
1. Machine speed
2. FAST
3. SLOW
4. NEUTRAL
5. REVERSE



decal106-5517

106-5517

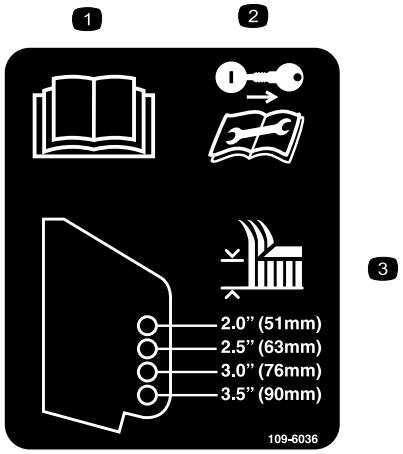
1. Warning—do not touch the hot surface.



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 fully 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.

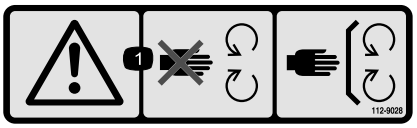


decal109-6036

109-6036

Rear Discharge Machines Only

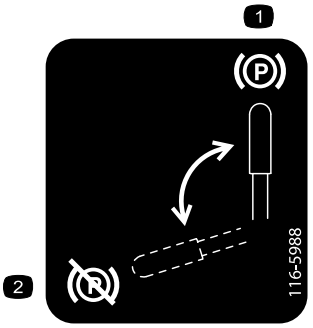
1. Read the *Operator's Manual*.
2. Remove the key and read the instructions before servicing or performing maintenance.
3. Height of cut



decal112-9028

112-9028

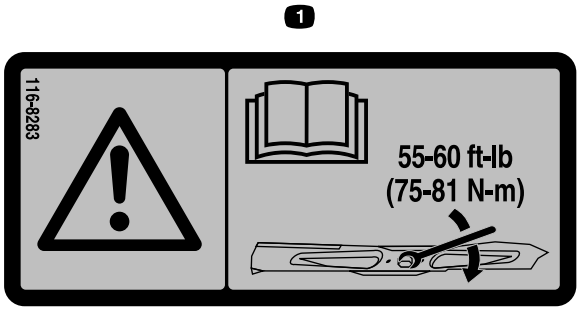
1. Warning—stay away from moving parts; keep all guards and shields in place.



decal116-5988

116-5988

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



decal116-8283

116-8283

1. Warning—read the *Operator's Manual* for instructions on torquing the blade bolt/nut to 75 to 81 N·m (55 to 60 ft-lb).



decal117-2718

117-2718

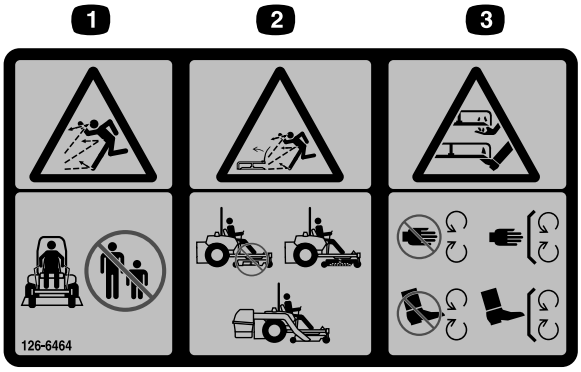


decal117-3276

117-3276

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

Side Discharge Mowers Only



decal126-6464

126-6464

1. Thrown object hazard—keep bystanders away.
2. Thrown objects hazard, mower—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.

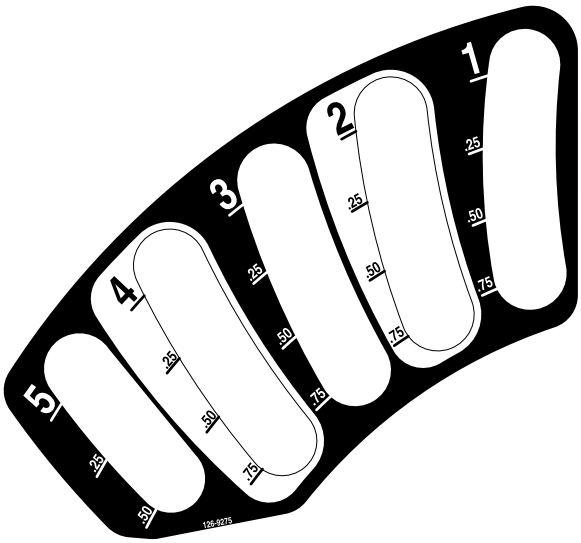


decal126-8383

126-8383

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.

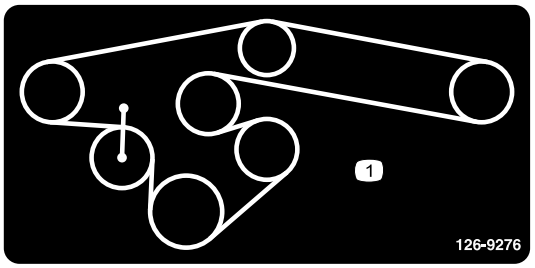
1. Warning—read the *Operator's Manual*; do not operate this machine unless you are trained; wear hearing protection.
2. Cutting/dismemberment hazard of the hand, mower blade; entanglement hazard of the hand, belt—stay away from moving parts; keep all guards and shields in place.
3. Ramp hazard—do not 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°.



decal126-9275

126-9275

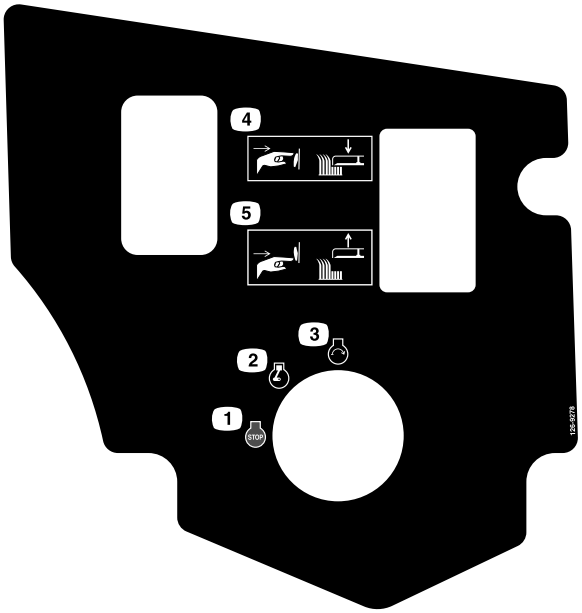
For Models with 152 cm (60-inch) or 183 cm (72-inch) Decks



decal126-9276

126-9276

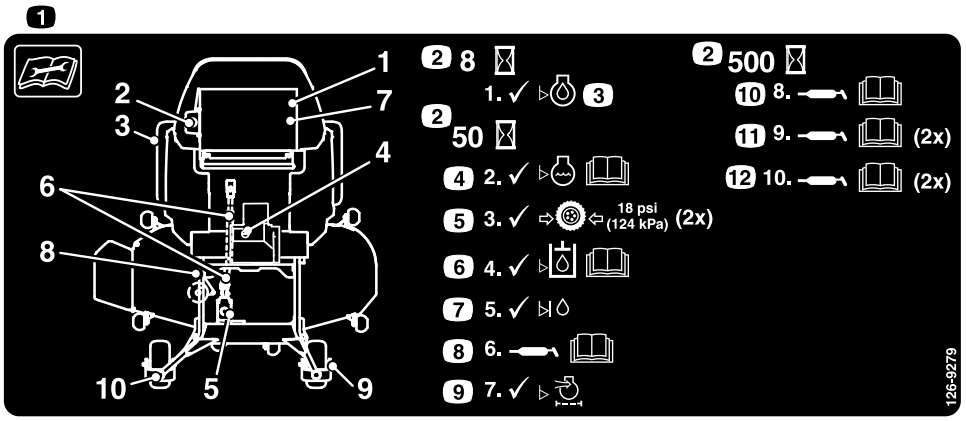
For Models with 183 cm (72-inch) Decks with Side Discharge



decal126-9278

126-9278

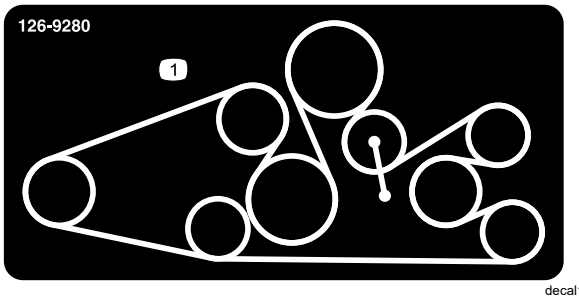
1. Engine—Off
2. Engine—On
3. Engine—Start
4. Push the bottom of the button to lower the deck.
5. Push the top of the button to raise the deck.



decal126-9279

126-9279

1. Read the instructions before servicing or performing maintenance to the machine.
2. Time interval
3. Check the engine-oil level.
4. Check the coolant level; refer to the *Operator's Manual* for further instructions.
5. Check the tire pressure (2 locations).
6. Check hydraulic-fluid level; refer to the *Operator's Manual* for further instructions.
7. Check the jackshaft-fluid level.
8. Grease the deck-drive PTO; refer to the *Operator's Manual* for further instructions.
9. Check the air cleaner.
10. Grease the idler pivot; refer to the *Operator's Manual* for further instructions
11. Grease the front caster wheel bearings (2 locations); refer to the *Operator's Manual* for further instructions.
12. Grease the front caster pivots (2 locations); refer to the *Operator's Manual* for further instructions.

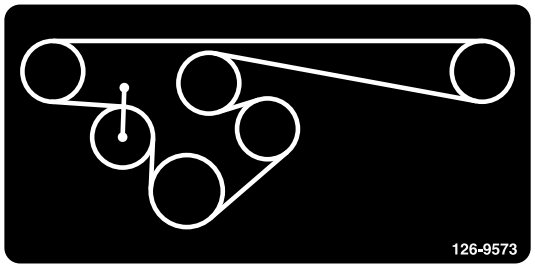


decal126-9280

126-9280

For Models with 152 cm (60-inch) or 183 cm (72-inch) Decks with Rear Discharge

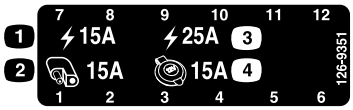
1. Belt routing



decal126-9573

126-9573

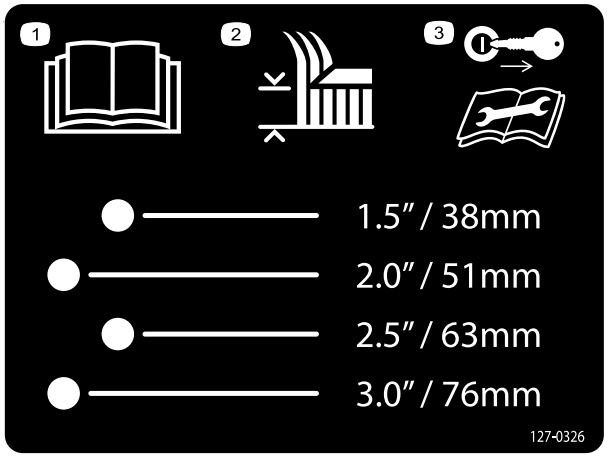
For Models with 152 cm (60-inch) Decks with Side Discharge



decal126-9351

126-9351

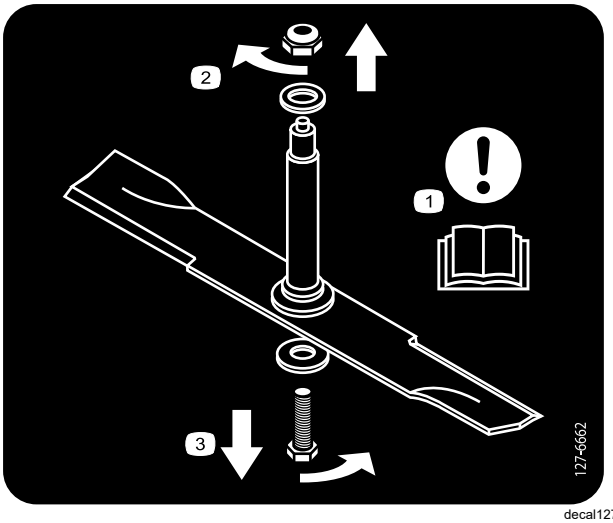
1. Chassis (15 A)
2. Accessory (15 A)
3. Main (25 A)
4. Power point (15 A)



decal127-0326

127-0326

1. Read the *Operator's Manual*.
2. Height of cut
3. Remove the key and read the *Operator's Manual* before performing maintenance or servicing the machine.

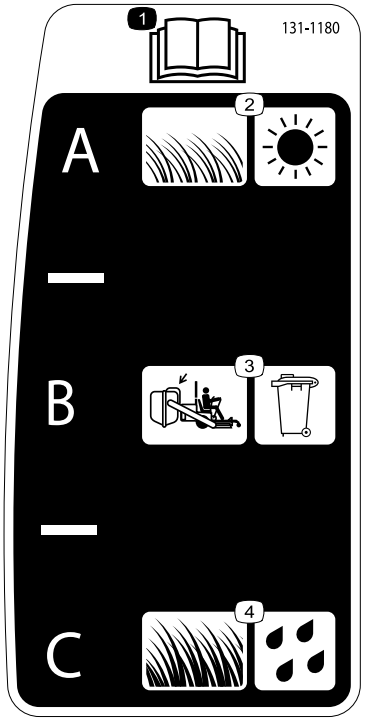


decal127-6662

127-6662

Rear Discharge Mowers Only

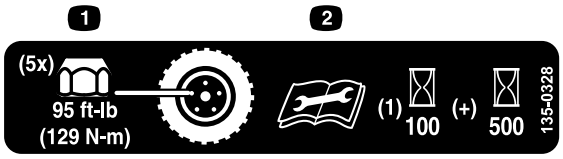
1. Attention—read the *Operator's Manual*.
2. Remove the nut by turning it clockwise.
3. Remove the bolt by turning it counter clockwise.



decal131-1180

131-1180

1. Read the *Operator's Manual*. (A) Short, light grass; dry conditions; maximum dispersion; (B) Bagging setting; (C) Tall, dense grass; wet conditions; maximum ground speed



decal135-0328

135-0328

1. Torque the wheel lug nuts to 129 N·m (95 ft-lb).
2. Read and understand the *Operator's Manual* before performing any maintenance; check the torque after the first 100 hours, then every 500 hours, thereafter.

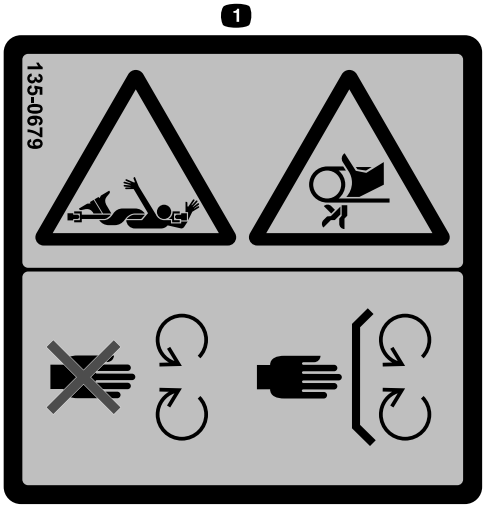
Rear Discharge Mowers Only



decal135-0664

135-0664

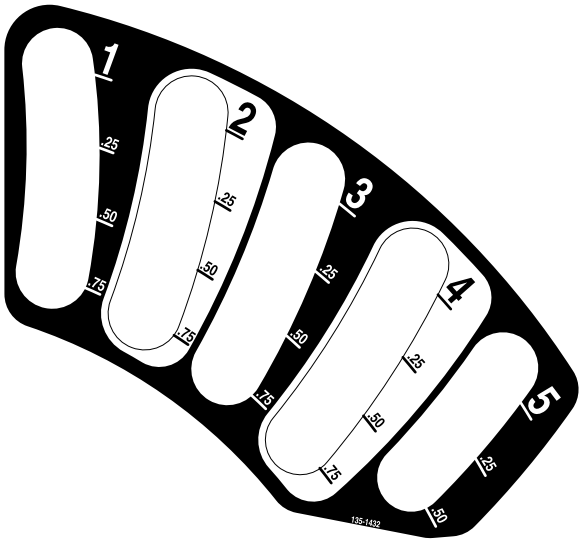
1. Thrown object hazard—keep bystanders away.
2. Cutting/dismemberment hazard of hands and feet—stay away from moving parts; keep all guards and shields in place.



decal135-0679

135-0679

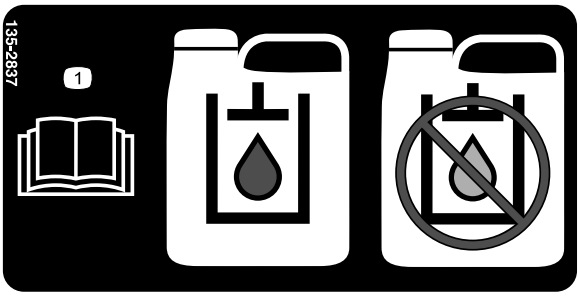
1. Rotating driveline hazard/entanglement hazard; belt—stay away from moving parts; keep all guards and shields in place.



decal135-1432

135-1432

For Models with 152 cm (60-inch) or 183 cm (72-inch) Decks



decal135-2837

135-2837

1. Read the *Operator's Manual* for more information; Use red Toro wet-clutch transmission fluid; do not use green hydraulic fluid.

Product Overview

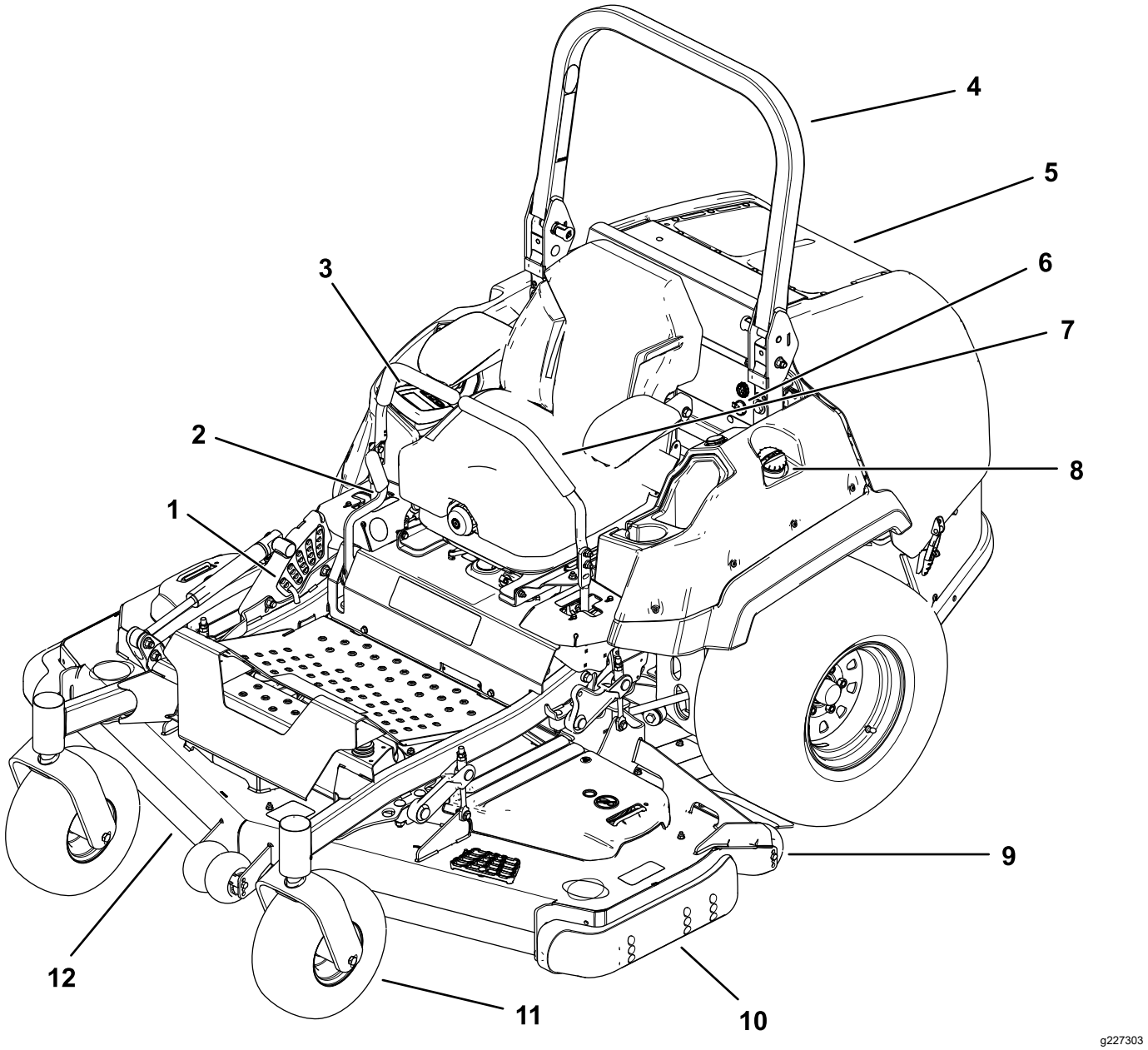


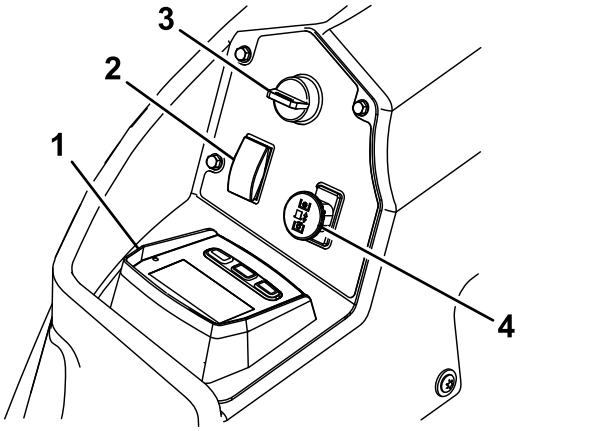
Figure 4

1. Height-of-cut pin
2. Parking-brake lever
3. Monitor/controls
4. Roll bar
5. Engine screen
6. Audible alarm and power point
7. Motion-control lever
8. Fuel-tank cap
9. Anti-scalp roller
10. Skid
11. Caster wheel
12. Mower deck

Controls

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

Control Panel



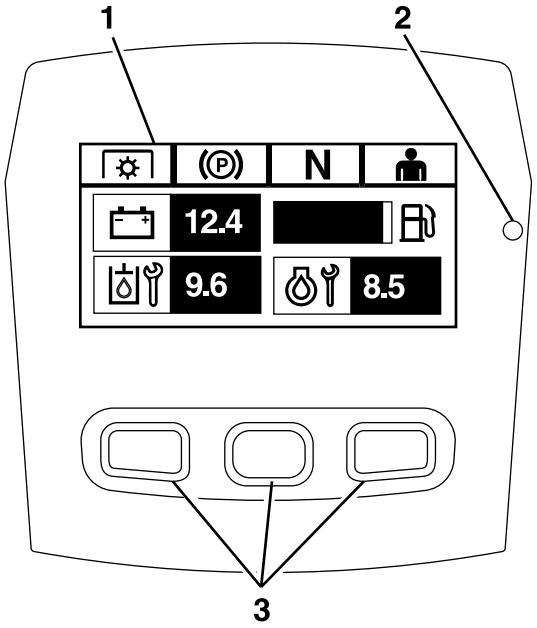
g225792

Figure 5

1. Horizon display monitor
2. Deck-left switch
3. Key switch
4. PTO

Horizon Display Monitor

Refer to the *Software Guide* for detailed information explaining the operator interface that allows you to access information, reset counters, modify system settings, and troubleshoot the equipment.



g228164

Figure 6

Horizon Display Monitor

1. Screen
2. LED status light
3. Buttons

Information Screen

The information screen displays information relative to machine operation; refer to the *Software Guide* for more information.

Buttons

The multi-functional buttons are located at the bottom of the panel. The icons displayed on the information screen above the buttons indicate the current function. The buttons allow you to select the engine speed and navigate through system menus.

Refer to the *Software Guide* for more information.

LED Status Light

The LED status light is multi-colored to indicate the system status and is located on the right side of the panel. During startup, the LED illuminates red to orange to green to verify functionality.

- **Solid green**—indicates normal operating activity
- **Blinking red**—indicates an active fault
- **Blinking green and orange**— indicates that a clutch reset is required

Refer to the *Software Guide* for more information.

Alarm

If an error occurs, an error message displays, the LED turns red, and the alarm sounds audibly as follows:

- A fast chirp sound indicates critical errors.
- A slow chirping sound indicates less critical errors, such as required maintenance or service intervals.

  Note: During startup, the alarm sounds briefly to verify functionality.

Refer to the *Software Guide* for more information.

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 5).

Hours are displayed in **Engine-Off** screen or in the **Engine Hour Counter** menu.

Refer to the *Software Guide* for more information.

Throttle Control

The throttle controls the engine speed, and there are 3 speeds: Maximum, Efficient, and Low.

Refer to the *Software Guide* for more information.

Deck-Lift Switch

Press the switch rearward to raise the deck.

Press the switch forward to lower the deck.

Blade-Control Switch (Power Takeoff)

The blade-control switch (PTO) engages and disengages power to the mower blades (Figure 5).

The LCD indicator appears on the information screen when the PTO switch is disengaged.

Note: Machines equipped with the Horizon Display Monitor have a clutch saver, which allows the throttle to automatically reduce the engine speed when you disengage the PTO switch. Engaging and disengaging the PTO switch changes the engine throttle between MOW and TRANSPORT mode.

Note: The system allows you to start the machine with the PTO switch engaged, but does not engage the blades. Engaging the PTO requires you to reset the PTO switch by disengaging, then engaging it.

Neutral-Lock Position

Use the NEUTRAL-LOCK position with the safety-interlock system to engage and to determine the NEUTRAL position.

Key Switch

Use this switch to start the engine. It has 3 positions: START, RUN, and OFF.

Note: The LCD indicators appear when each control meets the “safe to start” mode (e.g., the indicator turns on when you are in the seat.)

Note: The engine ECU controls the glow plugs during cold starts. If the coolant temperature is too low, the glow symbol displays on the monitor and the starter does not crank when you turn the engine to the START position. The glow plugs activate in the ON or START position. Once the glow has been on long enough for the current temperature, the glow symbol on the monitor disappears and the engine cranks when turned to the START position.

Note: The system allows you to start the machine the with the PTO switch engaged, but does not engage the blades. You must reset the PTO to engage the PTO.

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 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.

Specifications

Overall Width—Side Discharge Machines

	60-inch Deck	72-inch Deck
Without the deck	141.2 cm (55.6 inches)	152.4 cm (60 inches)
Deflector up	156 cm (61.4 inches)	186.4 cm (73.4 inches)
Deflector down	184.9 cm (72.8 inches)	215.6 cm (84.9 inches)

Overall Width—Rear Discharge Machines

60-inch Deck	72-inch Deck
168.2 cm (66.2 inches)	198.7 cm (78.2 inches)

Overall Length—Side Discharge Machines

	60-inch Deck	72-inch Deck
Roll bar up or down	244.9 cm (96.4 inches)	253 cm (99.6 inches)

Overall Length—Rear Discharge Machines

Roll bar up or down	255.5 cm (100.6 inches)

Overall Height—All Machines

Roll bar up	182.4 cm (71.8 inches)
Roll bar down	129.5 cm (51 inches)

Overall Height—All Machines

Roll bar up	182.4 cm (71.8 inches)
Roll bar down	129.5 cm (51 inches)

Tread Width of Drive Wheels—All Machines

112 cm (44.1 inches)

Tread Width of Caster Wheels (Center-to-Center of Tires)—Side Discharge Machines

60-inch Deck	72-inch Deck
101.3 cm (39.9 inches)	120.7 cm (47.5 inches)

Tread Width of Caster Wheels (Center-to-Center of Tires)—Rear Discharge Machines

60-inch Deck	72-inch Deck
84 cm (33.1 inches)	84 cm (33.1 inches)

Wheel Base (Center of Caster Tire to Center of Drive Tire)—Side Discharge Machines

60-inch Deck	72-inch Deck
146.3 cm (57.6 inches)	154.7 cm (60.9 inches)

Wheel Base (Center of Caster Tire to Center of Drive Tire)—Rear Discharge Machines

60-inch Deck	72-inch Deck
157.2 cm (61.9 inches)	157.2 cm (61.9 inches)

Operation

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

Before Operation

Before Operation Safety

General Safety

- Never allow children or untrained people to operate or service the machine. Local regulations may restrict the age of the operator. The owner is responsible for training all operators and mechanics.
- Become familiar with the safe operation of the equipment, operator controls, and safety signs.
- Know how to stop the machine and shut off the engine quickly.
- Check that operator-presence controls, safety switches, and shields are attached and functioning properly. Do not operate the machine unless they are functioning properly.
- Before mowing, always inspect the machine to ensure that the blades, blade bolts, and cutting assemblies are in good working condition. Replace worn or damaged blades and bolts in sets to preserve balance.
- Inspect the area where you will use the machine and remove all objects that the machine could throw.
- Evaluate the terrain to determine the appropriate equipment and any attachments or accessories required to operate the machine properly and safely.

Fuel Safety

- To avoid personal injury or property damage, use extreme care in handling fuel. Fuel vapors are flammable and explosive.
- Extinguish all cigarettes, cigars, pipes, and other sources of ignition.
- Use only an approved fuel container.
- Do not remove the fuel cap or add fuel to the fuel tank while the engine is running or while hot.
- Do not refuel the machine indoors.
- Do not store the machine or fuel container where there is an open flame, spark, or pilot light, such as on a water heater or on other appliances.
- Do not fill containers inside a vehicle or on a truck or trailer bed with a plastic liner. Always place

containers on the ground, away from your vehicle before filling.

- Remove the equipment from the truck or trailer and refuel it while it is on the ground. If this is not possible, then refuel from a portable container rather than a fuel-dispenser nozzle.
- Do not operate the machine without the entire exhaust system in place and in proper working condition.
- Keep the fuel-dispenser nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete. Do not use a nozzle lock-open device.
- If you spill fuel on your clothing, change your clothing immediately. Wipe up any fuel that spills.
- Never overfill the fuel tank. Replace the fuel cap and tighten it securely.
- Store fuel in an approved container and keep it out of the reach of children. Never buy more than a 30-day supply of fuel.
- Do not fill the fuel tank completely full. Add fuel to the fuel tank until the level is 6 to 13 mm (1/4 to 1/2 inch) below the bottom of the filler neck. This empty space in the tank allows fuel to expand.
  - Avoid prolonged breathing of vapors.
  - Keep your face away from the nozzle and fuel tank opening.
  - Avoid contact with skin; wash off spills with soap and water.

Adding Fuel

Recommended Fuel

The engine runs on clean, fresh diesel fuel with a minimum cetane rating of 40. Purchase fuel in quantities that can be used within 30 days to ensure fuel freshness.

Use summer-grade diesel fuel (No. 2-D) at temperatures above -7°C (20°F) and winter-grade diesel fuel (No. 1-D or No. 1-D/2-D blend) below -7°C (20°F). Use of winter-grade diesel fuel at lower temperatures provides lower flash point and pour point characteristics, therefore easing startability and lessening chances of chemical separation of the fuel due to lower temperatures (wax appearance, which may plug filters).

Using summer-grade diesel fuel above -7°C (20°F) contributes toward longer life of the pump components.

Important: **Do not use kerosene or gasoline instead of diesel fuel. Failure to observe this caution will damage the engine.**

Biodiesel Ready

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

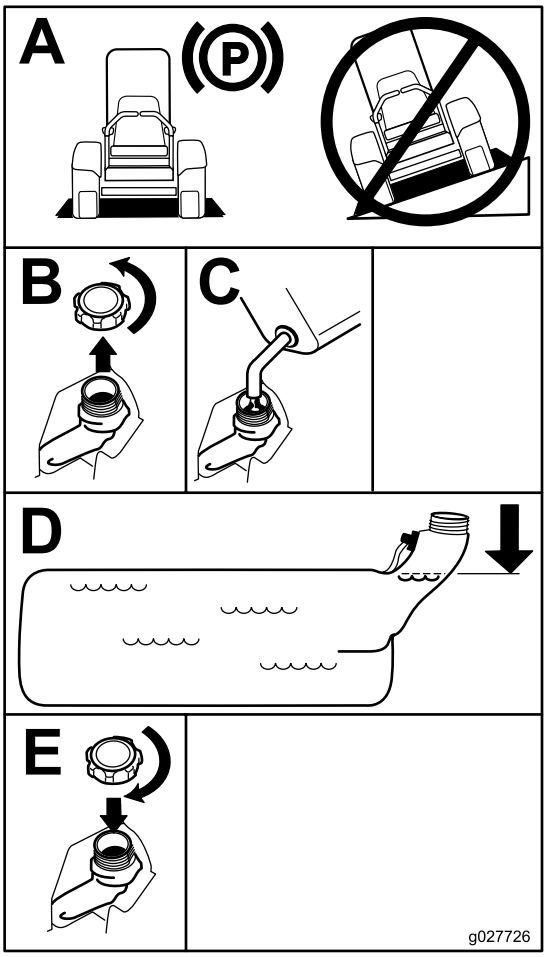
Observe the following precautions:

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

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 7).

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



g027726

Figure 7

Performing Daily Maintenance

Before starting the machine each day, perform the Each Use/Daily procedures listed in Maintenance (page 34).

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

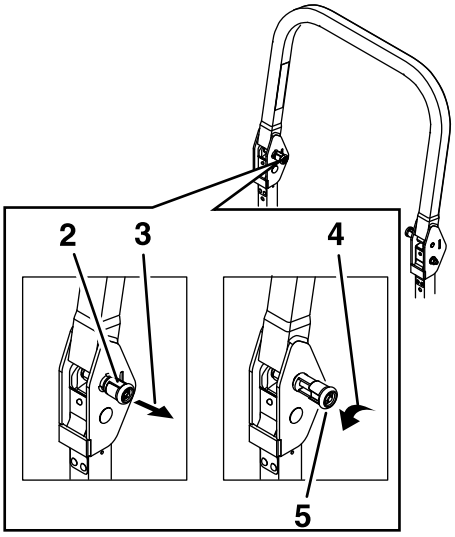
There is no rollover protection when the roll bar is in the down position.

- **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 they are not engaged (Figure 8).
3. Lower the roll bar to the down position (Figure 8).



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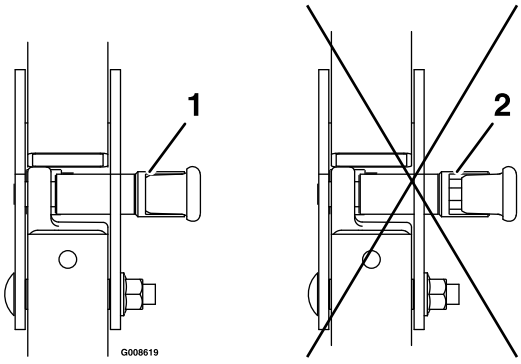
Figure 8

1. Upper part of the roll bar
2. Knob in the latched position
3. Pull the knob to unlatch.
4. Rotate the knob out 90° to hold it in the unlatched position.
5. Knob in the unlatched 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 9).
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 9).
3. Push on the roll bar and ensure that both pins are engaged (Figure 9).



g008619

Figure 9

1. Engaged
2. Partially engaged—do not operate the machine with the ROPS in this position.

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.**

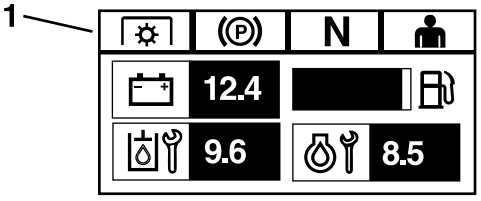
Understanding the Safety-Interlock System

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

- The 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 Horizon Display Monitor has symbols to notify the user when the interlock component is in the correct position. When the component is in the correct position, the corresponding symbol displays on the monitor.



g230650

Figure 10

1. Symbols display on the monitor 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 moves forward and backward. Position the seat where you have the best control of the machine and are most comfortable.

To adjust, move the lever sideways to unlock the seat (Figure 11).

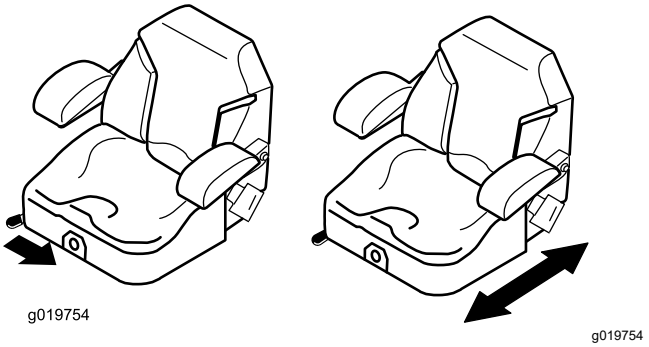


Figure 11

Unlatching the Seat

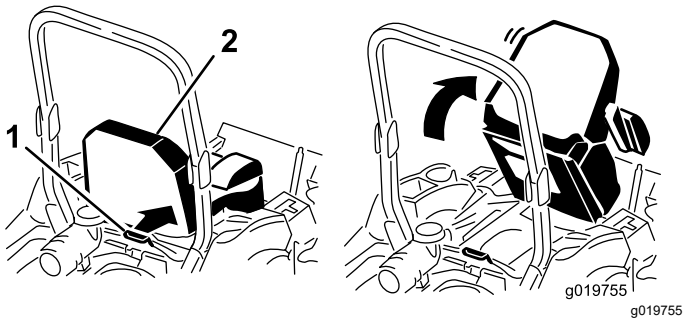


Figure 12

1. Seat latch
2. Seat

Changing the Seat Suspension

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 13).

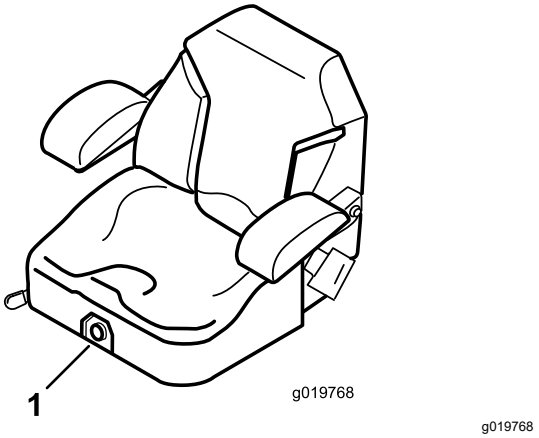


Figure 13

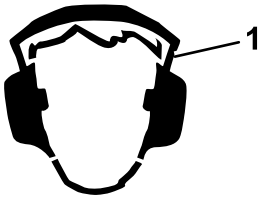
1. Seat-suspension knob

During Operation

During Operation Safety

General Safety

- The owner/operator can prevent and is responsible for accidents that may cause personal injury or property damage.
- Wear appropriate clothing, including eye protection; long pants; slip-resistant, substantial footwear; and hearing protection. Tie back long hair and do not wear loose jewelry.
- Do not operate the machine while ill, tired, or under the influence of alcohol or drugs.
- Never carry passengers on the machine and keep bystanders and pets away from the machine during operation.
- Operate the machine only in good visibility to avoid holes or hidden hazards.
- Avoid mowing on wet grass. Reduced traction could cause the machine to slide.
- Ensure that all drives are in neutral, the parking brake is engaged, and you are in the operating position before you start the engine.
- Keep your hands and feet away from the cutting units. Keep clear of the discharge opening at all times.
- Look behind and down before backing up to be sure of a clear path.
- Use care when approaching blind corners, shrubs, trees, or other objects that may obscure your vision.
- Do not mow near drop-offs, ditches, or embankments. The machine could suddenly roll over if a wheel goes over the edge or if the edge gives way.
- Stop the blades whenever you are not mowing.
- Stop the machine, shut off the engine, remove the key, and inspect the blades after striking an object or if there is an abnormal vibration in the machine. Make all necessary repairs before resuming operation.
- Slow down and use caution when making turns and crossing roads and sidewalks with the machine. Always yield the right-of-way.
- Disengage the drive to the cutting unit, shut off the engine, and remove the key before adjusting the height of cut (unless you can adjust it from the operating position).
- Never run an engine in an area where exhaust gases are enclosed.
- Never leave a running machine unattended.
- Before leaving the operating position (including to empty the catchers or to unclog the chute), do the following:
  - Stop the machine on level ground.
  - Disengage the power takeoff and lower the attachments.
  - Engage the parking brake.
  - Shut off the engine and remove the key.
  - Wait for all moving parts to stop.
- Do not operate the machine when there is the risk of lightning.
- Do not use the machine as a towing vehicle unless it has a hitch installed.
- Do not change the governor speed or overspeed the engine.
- Use only accessories and attachments approved by Toro.
- 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.



g229846

Figure 14

1. Wear hearing protection.

Rollover Protection System (ROPS) Safety

- **Do not** remove the roll bar from the machine.
- Ensure that the seat belt is attached and that you can release it quickly in an emergency.
- Always wear your seat belt when the roll bar is up.
- Check carefully for overhead obstructions and do not contact them.
- Keep the roll bar in safe operating condition by thoroughly inspecting it periodically for damage and keeping all the mounting fasteners tight.
- Replace a damaged roll bar. Do not repair or alter it.

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, do the following:

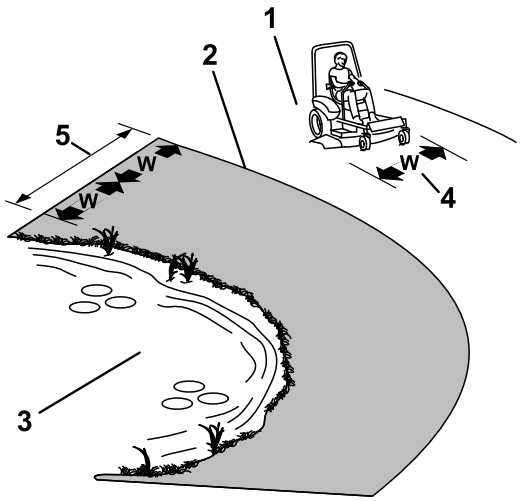
  – Review and understand the slope instructions in the manual and on the machine.

  – 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.
- 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 counterweights.
- 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.



g221745

Figure 15

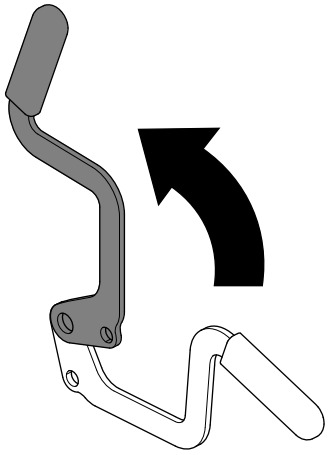
1. Safe Zone—use the machine here on slopes less than 15 degrees or flat areas.
2. Danger Zone—use a walk-behind mower and/or a hand trimmer on slopes greater than 15 degrees and near drop-offs or water.
3. Water
4. W=width of the machine
5. Keep a safe distance (twice the width of the machine) between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

Operating the Parking Brake

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

Engaging the Parking Brake

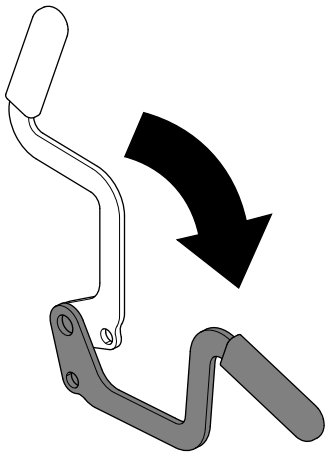
Park the machine on a level surface.



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Figure 16

Disengaging the Parking Brake



g227610

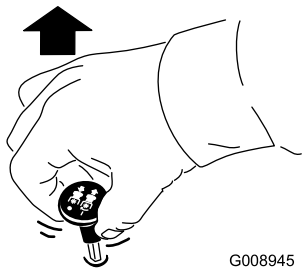
Figure 17

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.

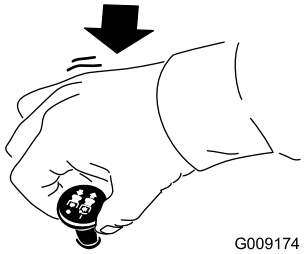


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g008945

Figure 18

Disengaging the Blade-Control Switch (PTO)



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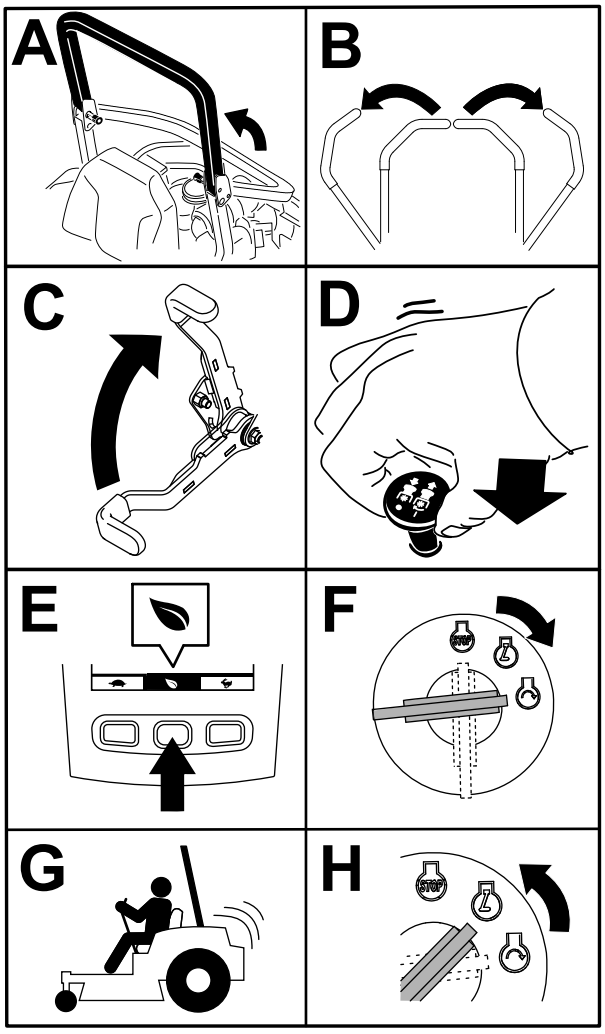
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Figure 19

Starting the Engine

Important: **Do not engage the starter for more than 5 seconds at a time. If the engine fails to start, wait 15 seconds between attempts. Failure to follow these instructions can burn out the starter motor.**

Note: You may need multiple attempts to start the engine the first time after adding fuel to an empty fuel system.



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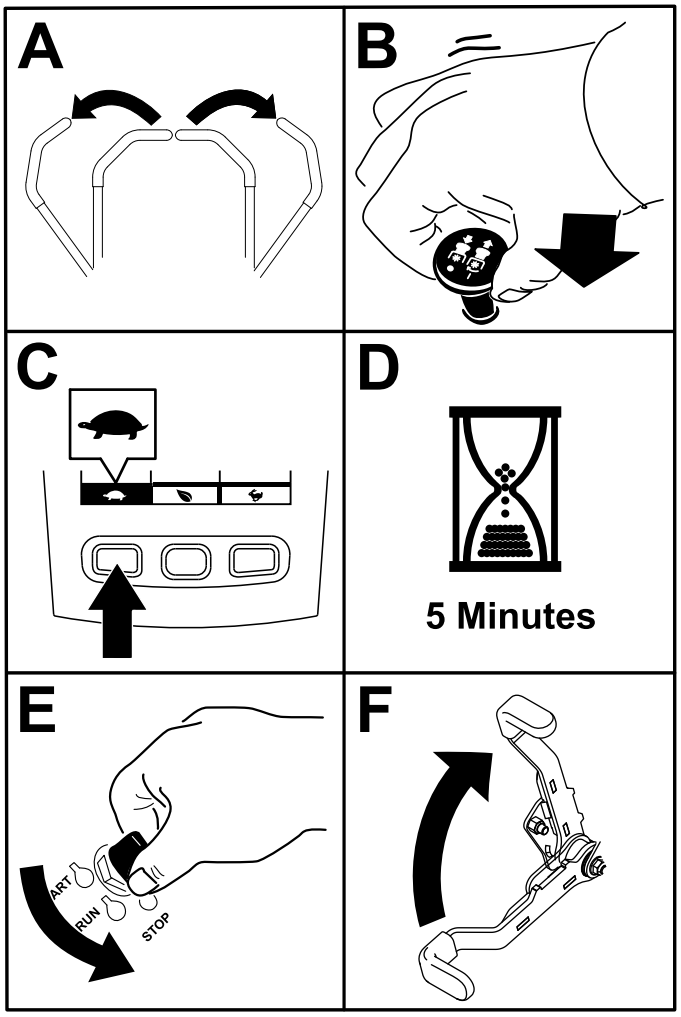
Figure 20

Shutting Off the Engine

⚠ 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.



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Figure 21

Using the Motion-Control Levers

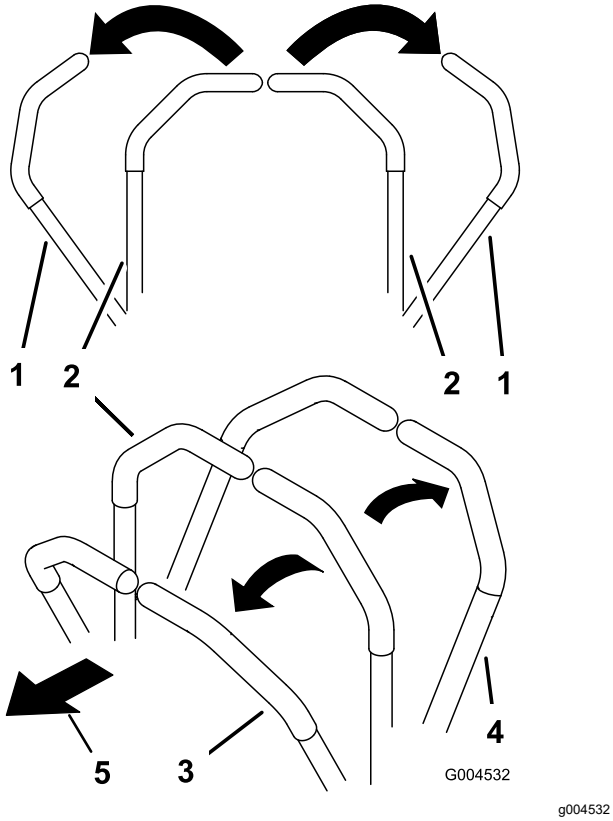


Figure 22

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 23).
2. Move the levers to the center, unlocked position.
3. To go forward, slowly push the motion-control levers forward (Figure 23).

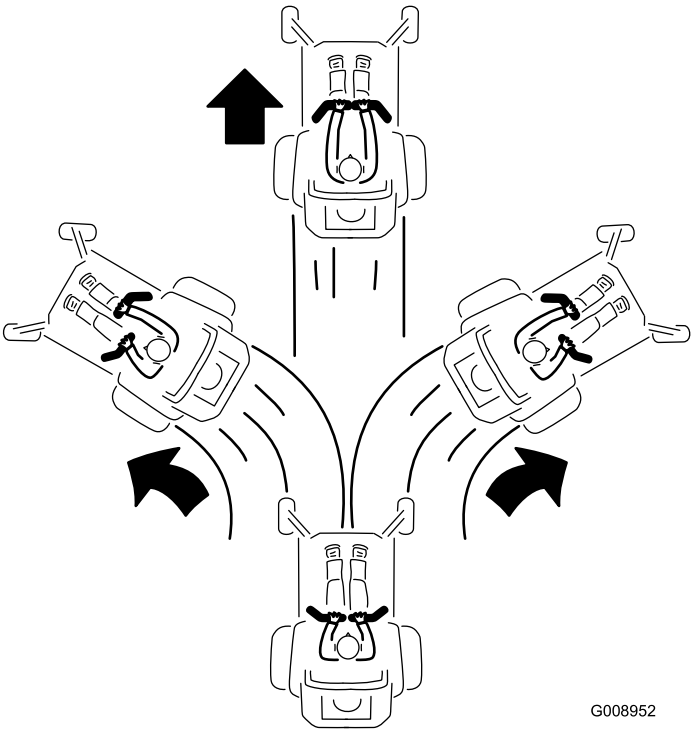


Figure 23

Driving Backward

1. Move the levers to the center, unlocked position.
2. To go backward, slowly pull the motion-control levers rearward (Figure 24).

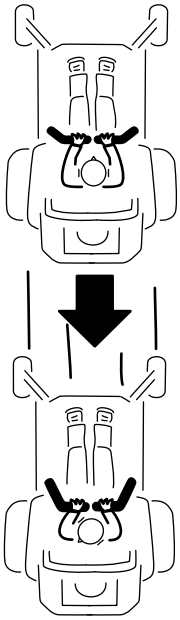


Figure 24

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

Adjust the height of cut from 25 to 140 mm (1 to 5-1/2 inches) in 6 mm (1/4 inch) increments by moving the clevis pin into different hole locations.

1. With the engine running, push the deck-lift switch rearward until the mower deck is fully raised, and release the switch immediately.
2. Rotate the height-of-cut pin until the roll pin in it lines up with the slots in the holes in the height-of-cut bracket and remove it (Figure 25).
3. Insert the height-of-cut pin into the hole corresponding to the desired cutting height (Figure 25).

   Refer to the decal on the side of the deck-lift plate for the heights of cut (Figure 25).
4. Using the deck-lift switch, move the deck height out of the transport position (or 5-1/2 inches (140 mm) cutting height) and down to the selected height.

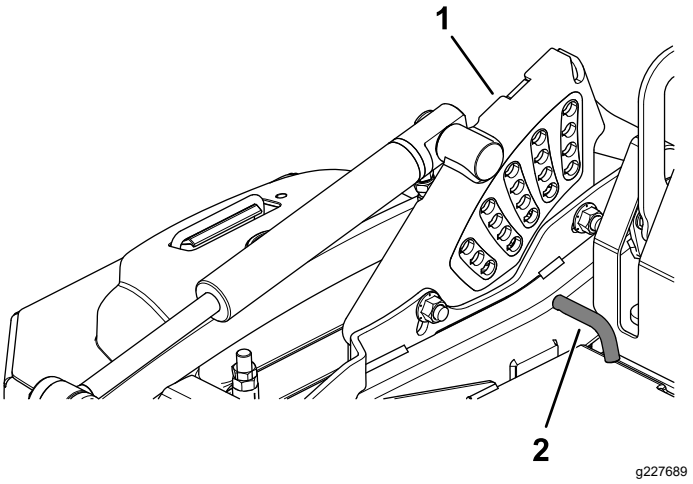


Figure 25

1. Height-of-cut bracket
2. Height-of-cut pin

Adjusting the Anti-Scalp Rollers

For maximum deck flotation, install the rollers 1 hole position lower. Rollers should maintain a 6 mm (1/4 inch) clearance to the ground. Do not adjust the rollers to support the deck.

1. Park the machine on a level surface.
2. Disengage the blade-control switch (PTO), move the motion-control levers to the NEUTRAL-LOCK position, 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. Adjust the anti-scalp rollers as shown in Figure 26, Figure 27, Figure 28, and Figure 29.

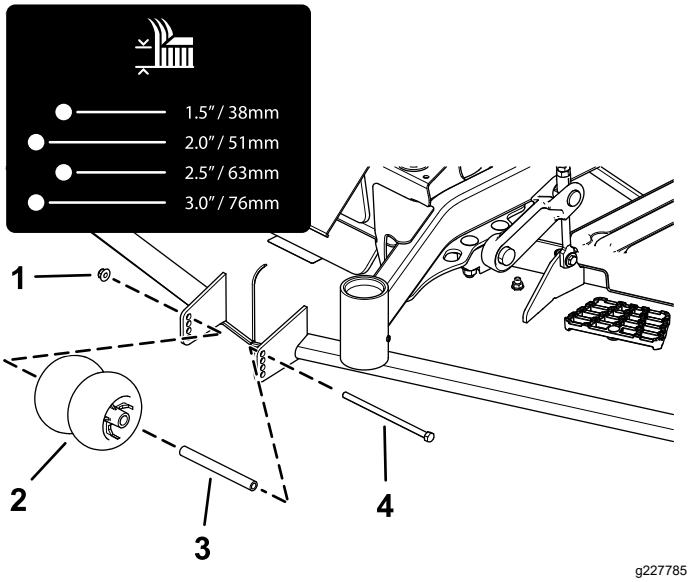


Figure 26

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

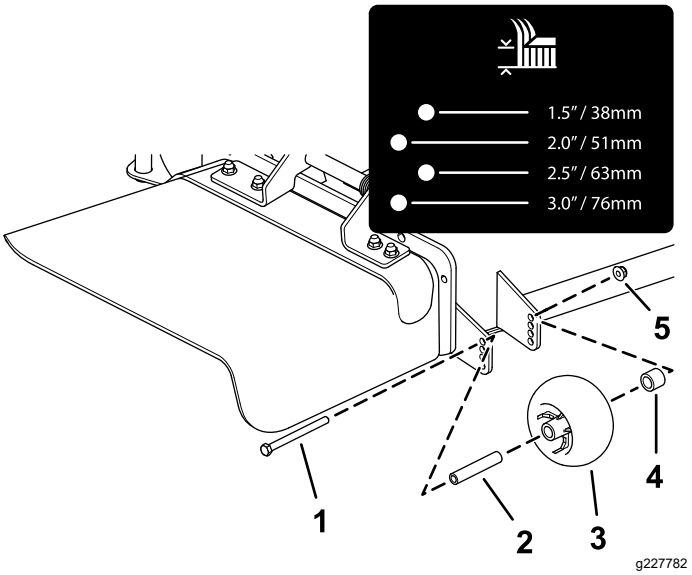


Figure 27
Side Discharge Machines

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

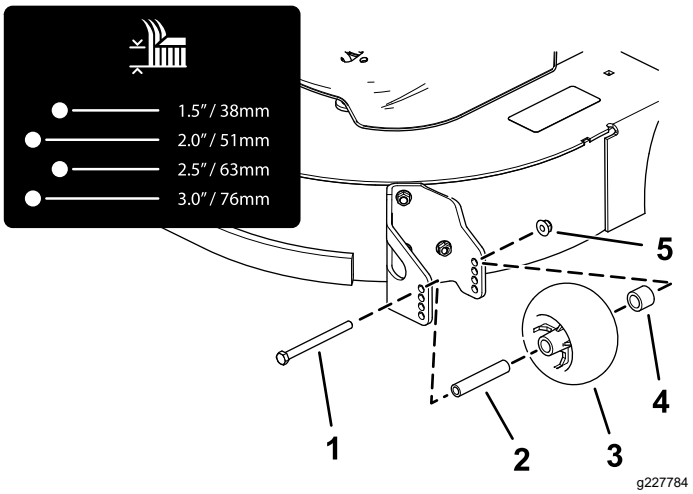


Figure 28
Side Discharge Machines

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

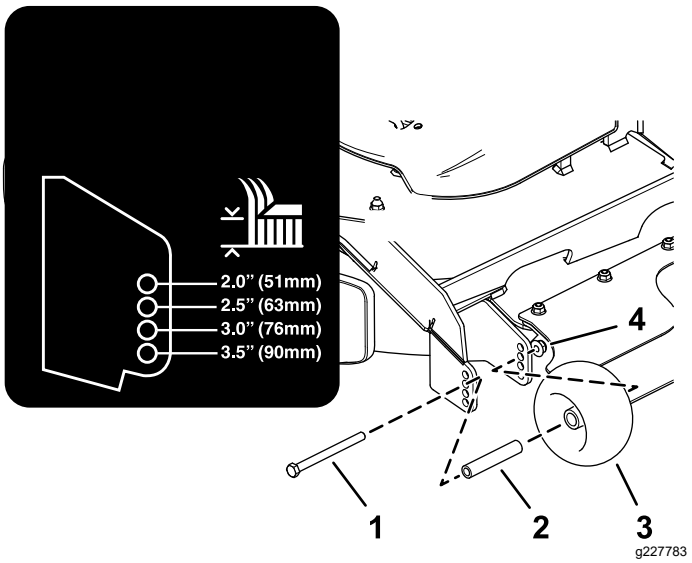


Figure 29
Rear Discharge Machines

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

5. For **side discharge machines**, torque the flange nut to 68 to 75 N·m (50 to 55 ft-lb).
6. For **rear discharge machines**, torque the flange nut to 41 to 47 N·m (30 to 35 ft-lb).

Adjusting the Flow Baffle Cam Locks

For Machines with Side Discharge

This procedure is applicable only to machines with the flow-baffle locks. Certain models have nuts and bolts in place of the flow-baffle locks and can be adjusted the same.

You can adjust the mower-discharge flow for different types of mowing conditions. Position the cam locks and baffle to give the best quality of cut.

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. To adjust the cam locks, swing the lever up to loosen the cam lock (Figure 30).
4. Adjust the baffle and cam locks in the slots to the desired discharge flow.
5. Swing the lever back over to tighten the baffle and cam locks (Figure 30).
6. If the cam locks do not lock the baffle into place or it is too tight, loosen the lever and then rotate the cam lock.

   Note: Adjust the cam lock until the desired locking pressure is achieved.

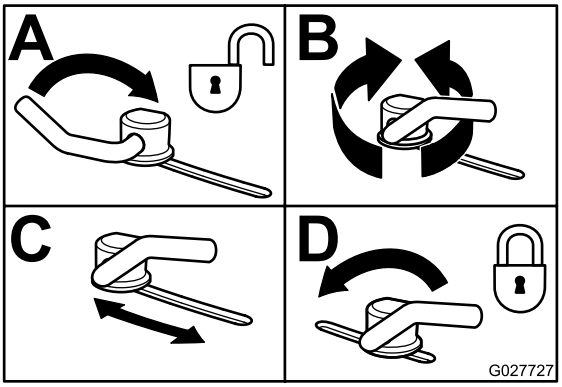


Figure 30

Positioning the Flow Baffle

For Machines with Side Discharge

The following figures are only recommendations for use. Adjustments vary by grass type, moisture content, and the height of the grass.

Note: If the engine power draws down and the mower ground speed is the same, open up the baffle.

Position A

This is the full rear position. The suggested use for this position is as follows:

- Short, light grass mowing conditions
- Dry conditions
- Smaller grass clippings
- Propels grass clippings farther away from the mower

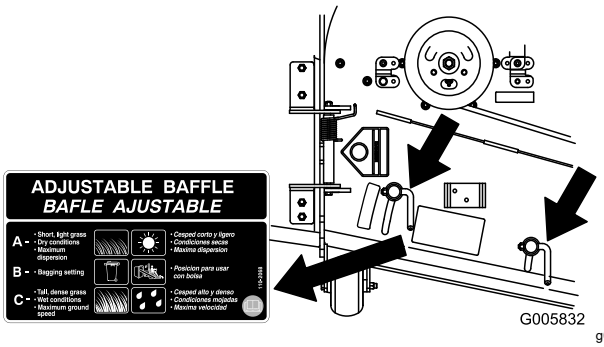


Figure 31

Position B

Use this position when bagging. Always align it with the blower opening.

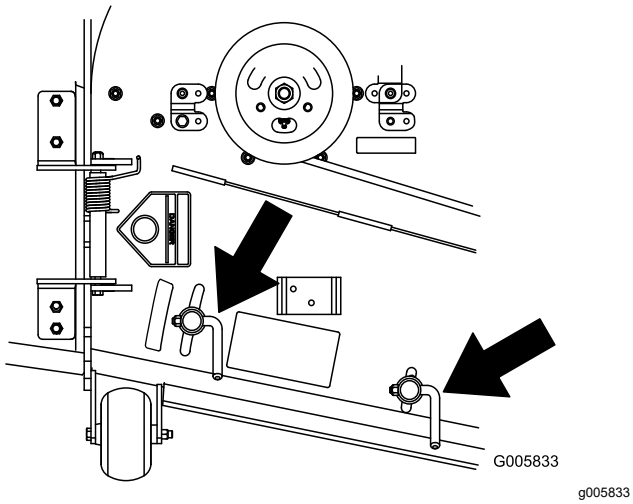


Figure 32

Position C

This is the full open position. The suggested use for this position is as follows:

- Tall, dense grass mowing conditions
- Wet conditions
- Lowers the engine-power consumption
- Allows increased ground speed in heavy conditions

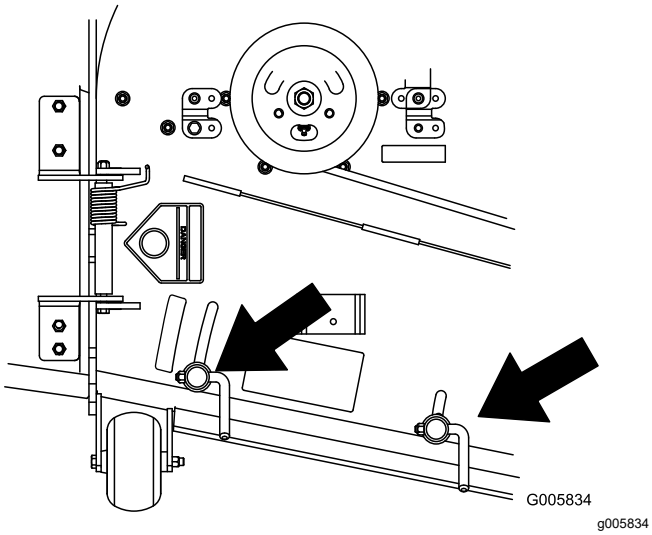


Figure 33

Adjusting the Skids

For Models with Rear Discharge

Mount the skids in the lower position when operating at heights of cut greater than 51 mm (2 inches) and in a higher position when operating at heights of cut lower than 51 mm (2 inches).

Adjust the skids as shown in Figure 34.

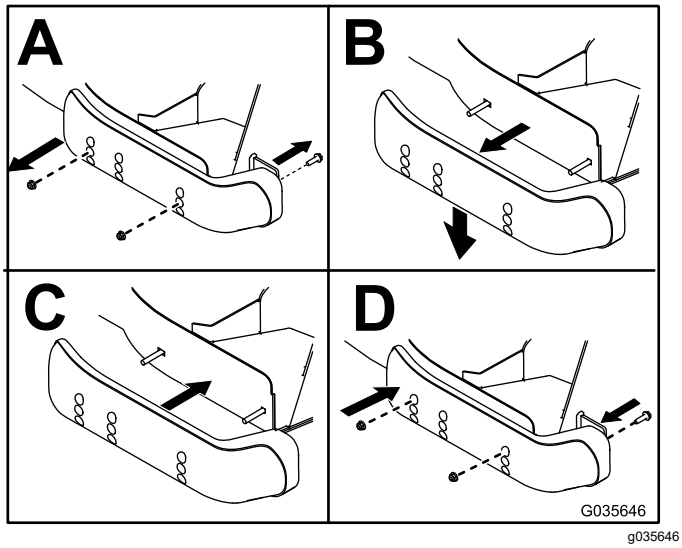


Figure 34

Operating with the Overheat Sensor

The PTO disengages, an alarm sounds, and a bar graph displays the engine temperature when it reaches an overheat condition. The PTO does not engage until the engine has cooled and you manually shut off the PTO and engage it.

Note: If the engine-coolant level is below the indicator line on the overflow bottle when the engine is cold, the coolant temperature gauge may not register correctly during operation and/or the audible alarm may not sound if the engine overheats.

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

- Clean grass and debris from the cutting units, mufflers, and engine compartment to help prevent fires. Clean up oil or fuel spills.
- Shut off the fuel and remove the key before storing or transporting the machine.
- Disengage the drive to the attachment whenever you are transporting or not using the machine.
- Allow the engine to cool before storing the machine in any enclosure.
- Never store the machine or fuel container where there is an open flame, spark, or pilot light, such as on a water heater or on other appliances.

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 35).

- **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.**

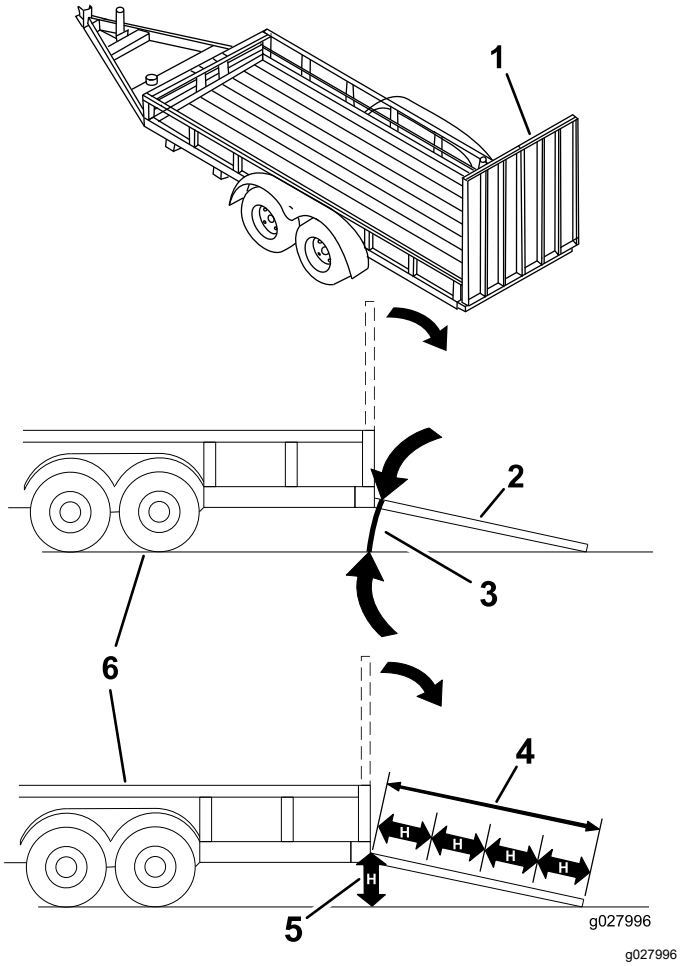


Figure 35

1. Full-width ramp in stowed position
2. Side view of full-width ramp in loading position
3. Not greater than 15 degrees
4. Ramp is at least 4 times as long as the height of the trailer or truck bed to the ground
5. H=height of the trailer or truck bed to the ground
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 35).
4. Back the machine up the ramp (Figure 36).

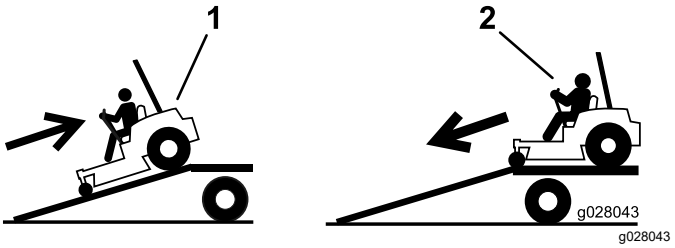


Figure 36

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 37). Refer to local regulations for tie-down requirements.

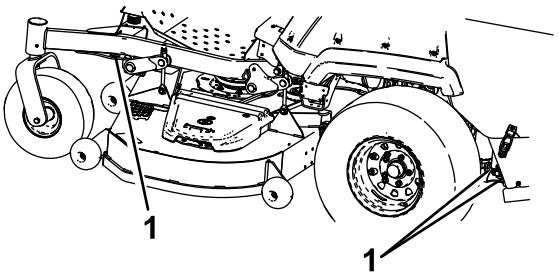


Figure 37

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 35).
2. Drive the machine forward down the ramp (Figure 36).

Maintenance

Maintenance Safety

- Before repairing the machine do the following:
  - Disengage the drives.
  - Engage the parking brake.
  - Shut off the engine and remove the key.
- Park the machine on a level surface.
- Clean grass and debris from the cutting unit, drives, mufflers, and engine to help prevent fires.
- Clean up oil or fuel spills.
- Do not allow untrained personnel to service the machine.
- Use jack stands to support the machine and/or components when required.
- Carefully release pressure from components with stored energy.
- Disconnect the battery before making any repairs. Disconnect the negative terminal first and the positive terminal last. Connect the positive terminal first and negative last.
- Use care when checking the blades. Wrap the blade(s) or wear thickly padded gloves, and use caution when servicing them. Only replace blades; do not straighten or weld them.
- Keep your hands and feet away from moving parts. If possible, do not make adjustments with the engine running.
- Keep all parts in good working condition and all hardware tightened, especially the blade-attachment bolts. Replace all worn or damaged decals.
- Never interfere with the intended function of a safety device or reduce the protection provided by a safety device. Check their proper operation regularly.
- 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.
- Check the parking brake operation frequently. Adjust and service as required.

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first 100 hours	• Check the wheel lug nuts. • Adjust the parking brake.
After the first 200 hours	• Change the engine oil and filter. • Change the deck gearbox oil. • Change the hydraulic fluid and filter.
Before each use or daily	• Check the safety system. • Check the engine-oil level. • Check the engine-coolant level. • Check the hydraulic-fluid level. • Inspect the blades. • Clean the engine and exhaust system area. • Clean the grass and debris build-up from the machine and mower deck.
Every 50 hours	• Grease the drive U-joints and splined slip joint. • Drain the fuel filter/water separator. • Check the tire pressure • Check the gearbox-oil level. • Clean the engine-cooling system (more often in dirty and dusty conditions). • Inspect the belts for cracks and wear.
Every 100 hours	• Check the alternator-belt tension.
Every 200 hours	• Change the engine oil and filter if not using Toro Premium Engine Oil, but any oil meeting API classification CJ-4 or higher or as stated in Engine-Oil Specifications.

Maintenance Service Interval	Maintenance Procedure
Every 400 hours	• Grease the deck-idler pivots. • Grease the caster pivots. • Service the air cleaner (More frequently in extremely dusty or dirty conditions). • Change the engine oil and filter if using Toro Premium Engine Oil (API classification CK-4 or higher) more often in dirty and dusty conditions. • Replace the fuel-filter canister for the water separator (more often in dirty and dusty conditions). • Check the fuel lines and connections. • Change the deck gearbox oil. • Adjust the parking brake. • Change the hydraulic fluid and filter if using Mobil® 424 hydraulic fluid.
Every 500 hours	• Adjust the caster-pivot bearing.
Every 800 hours	• Inspect the engine-valve clearance. • Change the hydraulic fluid and filter if using Toro Premium Transmission/Hydraulic Tractor Fluid.
Every 2,000 hours	• Change the engine coolant.
Monthly	• Check the battery charge.
Yearly	• Lubricate the caster-wheel hubs. • If you operate the machine less than 200 hours, change the engine oil and filter.

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

⚠ CAUTION

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

Remove the key from the switch before you perform any maintenance.

Lubrication

Greasing the Machine

Service Interval: Every 400 hours/Yearly (whichever comes first)—Grease the deck-idler pivots.

Grease more frequently when operating conditions are extremely dusty or sandy.

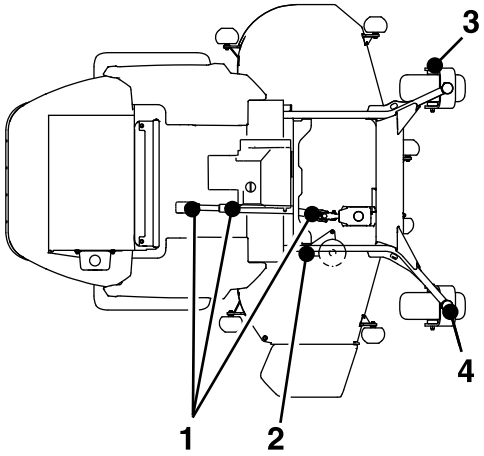
Grease Type: No. 2 lithium or molybdenum grease

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: Make sure that you scrape any paint off the front of the fitting(s).
4. Connect a grease gun to the fitting.
5. Pump grease into the fittings until grease begins to ooze out of the bearings.
6. Wipe up any excess grease.

Refer to the following chart for fitting locations and lubrication schedule.

Lubrication Chart			
Fitting Locations	**Initial Pumps**	**Number of Places**	**Service Interval**
1. Deck-drive PTO	1	3	Every 50 hours
2. Deck-idler pivots	1	1	Every 400 hours or yearly
3. Caster-wheel bearings	0	2	Yearly
4. Caster pivots	0	2	Every 400 hours or yearly



Lubricating the Drive U-Joints and Splined Slip Joint

Service Interval: Every 50 hours—Grease the drive U-joints and splined slip joint.

Note: For easier access to the drive U-joints and splined slip joint, remove the floor pan and fully lower the mower 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. Clean the grease fittings with a rag.
4. Connect a grease gun to the fitting.
5. Pump grease into the fittings until grease begins to ooze out of the bearings.
6. Wipe up any excess grease.

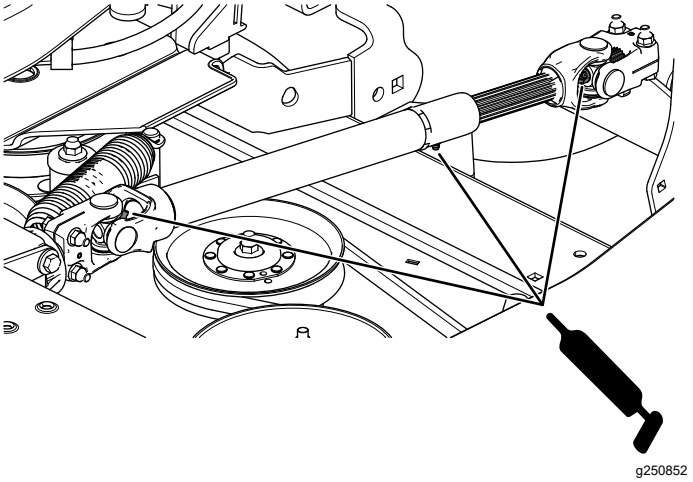


Figure 38

Lubricating the Caster Pivots

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

1. Remove hex plug and cap.
2. Thread the grease fitting in the hole and pump with grease until it oozes out around the top bearing.
3. Remove grease fitting and install the plug.
4. Install the cap.

Lubricating 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.

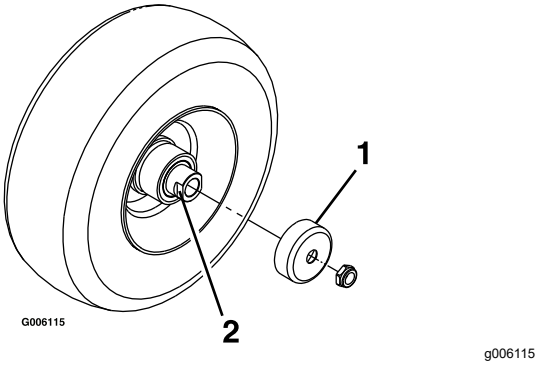


Figure 39

1. Seal guard
2. Spacer nut with wrench flats

3. Raise the mower for access.
4. Remove the caster wheel from the caster forks.
5. Remove the seal guards from the wheel hub.
6. Remove a spacer nut from the axle assembly in the caster wheel.

   Note: Thread-locking adhesive 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.

    Note: Replace the seals.
11. If the axle assembly is missing both spacer nuts, apply a thread-locking adhesive 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 of the wheel with the new seal and bearing.
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 adhesive 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, then torque 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 adhesive.**

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 the muffler and other hot surfaces.

Servicing the Air Cleaner

Checking the Air Cleaner

1. Check the air-cleaner body for damage, which could possibly cause an air leak.

   Replace a damaged air-cleaner body.

2. Check the air-intake system for leaks, damage, or loose hose clamps.
3. Service the air-cleaner filter when the air-cleaner indicator shows red (Figure 40).

   Important: **Do not over-service the air filter.**

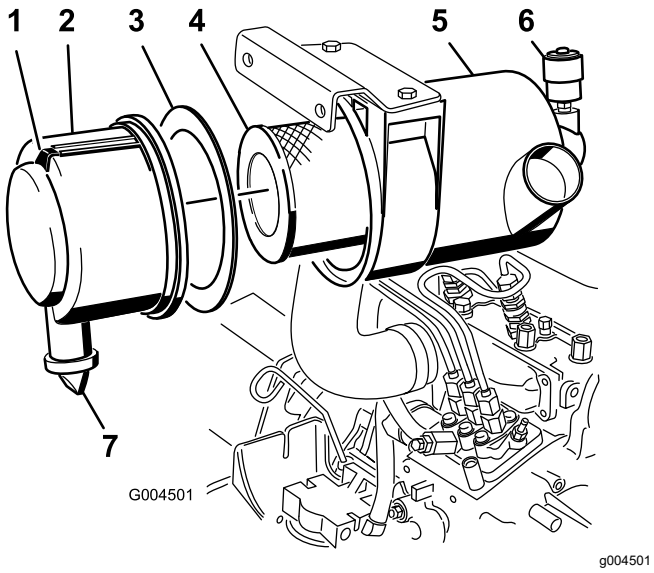


Figure 40

1. Air-cleaner cover
2. Gasket
3. Filter
4. Air-cleaner body
5. Air-cleaner indicator
6. Air-cleaner latch
7. Rubber outlet valve

4. Ensure that the cover seats correctly and seals with the air-cleaner body.

Servicing the Air Cleaner

Service Interval: Every 400 hours

Note: If the foam gasket in the cover is damaged, replace it.

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

Important: **Do not clean the used filter to avoid damaging the filter media.**

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

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

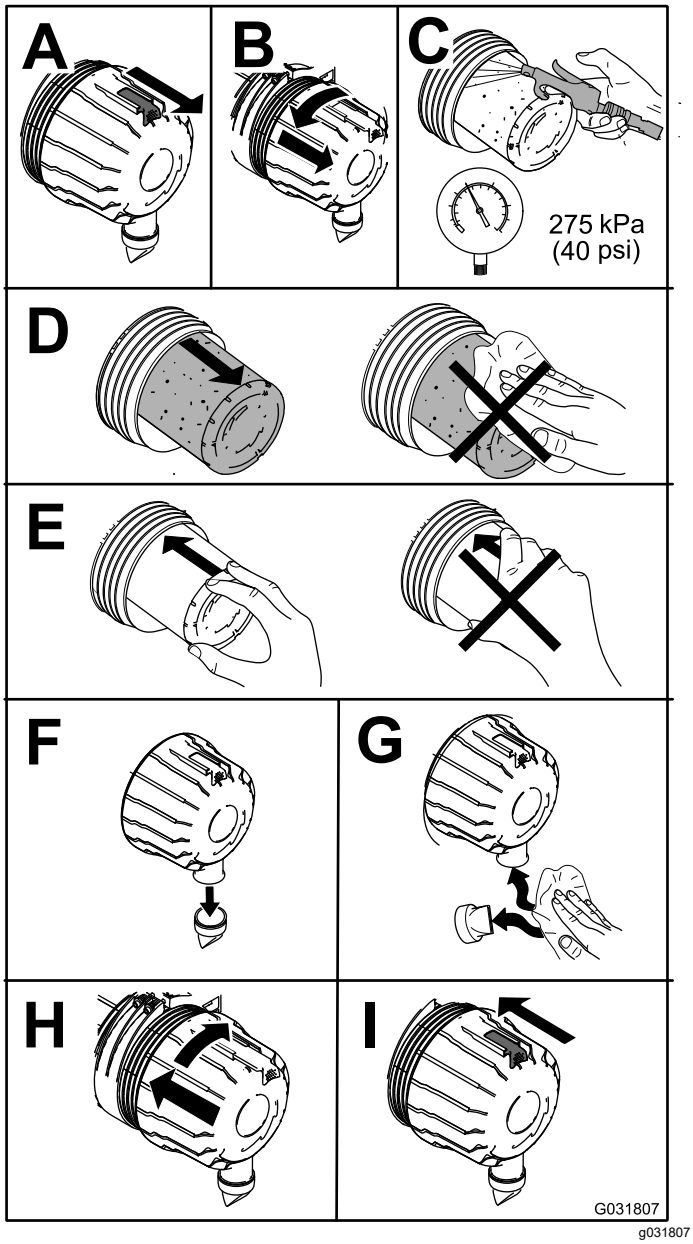


Figure 41

Servicing the Engine Oil

Engine-Oil Specifications

The engine ships with oil in the crankcase; however, check the oil level before and after you first start the engine. Check the oil level before operating the machine each day or each time you use the machine.

Crankcase capacity: 6.6 L (7 US qt) with the filter

Preferred engine oil: Toro Premium Engine Oil

If using an alternate oil, use high-quality, low-ash engine oil that meets or exceeds the following specifications:

- API service category CJ-4 or higher
- ACEA service category E6
- JASO service category DH-2

Important: **Using engine oil other than API classification CJ-4 or higher, ACEA E6, or JASO DH-2 may cause the diesel particulate filter to plug or cause engine damage.**

Use the following engine oil viscosity grade:

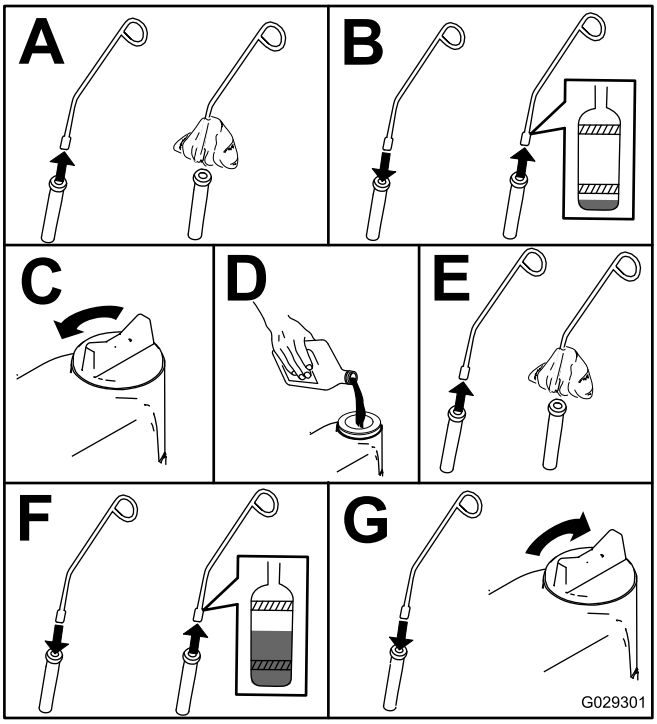
- SAE 10W-30 or 5W-30 (all temperatures)
- SAE 15W-40 (above 0° F)

Note: Toro Premium Engine oil is available from your distributor. See the *Parts Catalog* or contact an authorized Toro distributor for part numbers.

Checking the Engine-Oil Level

Service Interval: Before each use or daily

1. Park the machine on a level surface, lower the mower deck, move the throttle lever to the SLOW position, shut off the engine, and remove the key.
2. Open the hood.
3. Check the engine-oil level as shown in Figure 42.



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Figure 42

Changing the Engine Oil and Filter

Service Interval: After the first 200 hours—Change the engine oil and filter.

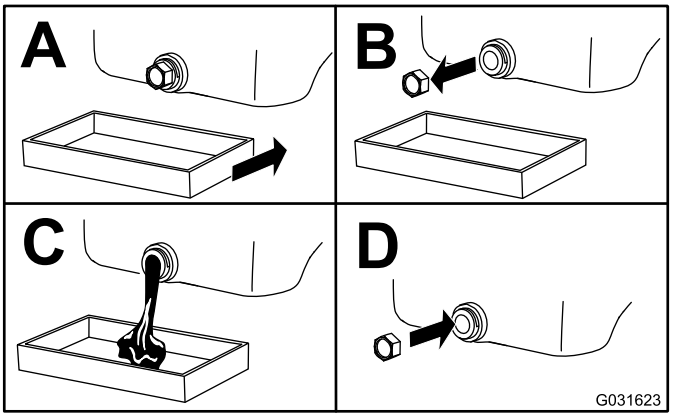
Every 200 hours—Change the engine oil and filter **if not using** Toro Premium Engine Oil, but any oil meeting API classification CJ-4 or higher or as stated in Engine-Oil Specifications.

Every 400 hours—Change the engine oil and filter **if using** Toro Premium Engine Oil (API classification CK-4 or higher) more often in dirty and dusty conditions.

Yearly—If you operate the machine less than 200 hours, change the engine oil and filter.

If possible, run the engine just before changing the oil because warm oil flows better and carries more contaminants than cold oil.

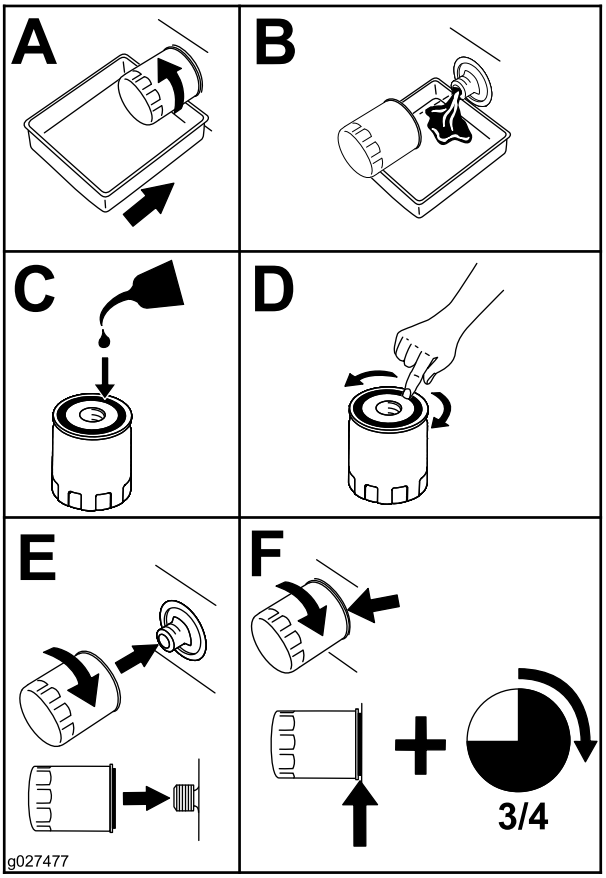
1. Park machine on a level surface.
2. Engage the parking brake.
3. Shut of the engine and remove the key.
4. Open the hood.
5. Change the engine oil as shown in Figure 43.



g031623

Figure 43

6. Replace the engine-oil filter as shown in Figure 44.



g027477

Figure 44

7. Fill the crankcase with oil; refer to Engine-Oil Specifications (page 39).

Fuel System Maintenance

⚠ WARNING

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

Use only approved fuel lines and fuel filters.

Draining the Fuel Filter/Water Separator

Service Interval: Every 50 hours—Drain the fuel filter/water separator.

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. Place a drain pan under the fuel filter and loosen the drain plug approximately 1 turn (Figure 45).

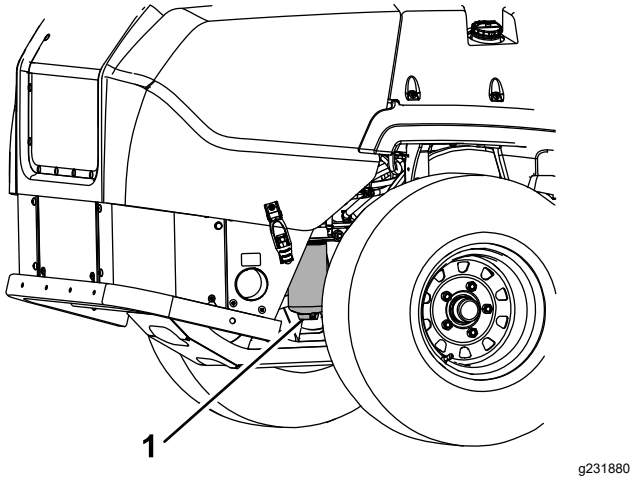


Figure 45

1. Fuel filter/water separator

4. After the water drains and fuel begins to flow from the filter, tighten the drain plug.

   Important: **Water or other contaminants in fuel can damage the fuel pump and/or other engine components.**

Changing the Water Separator

Service Interval: Every 400 hours—Replace the fuel-filter canister for the water separator (more often in dirty and dusty conditions).

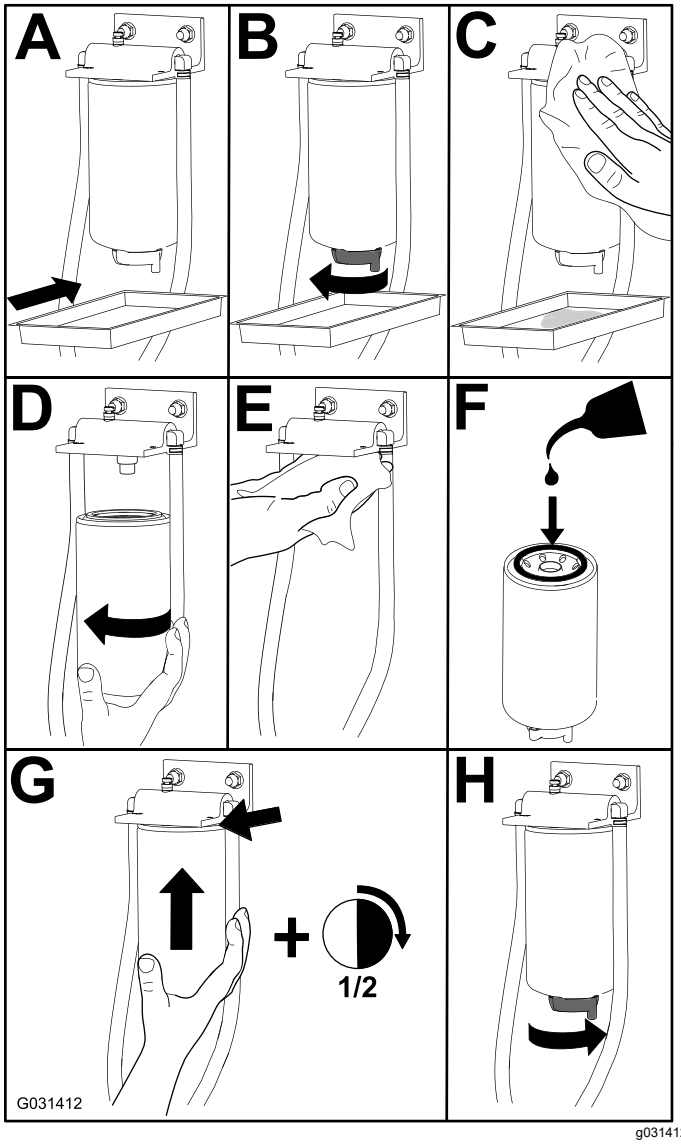


Figure 46

Inspecting the Engine-Valve Clearance

Service Interval: Every 800 hours

Inspect the engine-valve clearance. Refer to the engine owner's manual.

Checking the Fuel Lines and Connections

Service Interval: Every 400 hours

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

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

⚠ DANGER

Battery electrolyte contains sulfuric acid, which is fatal if consumed and causes severe burns.

Do not drink electrolyte and avoid contact with skin, eyes or clothing. Wear safety glasses to shield your eyes and rubber gloves to protect your hands.

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

Incorrect battery cable routing 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. Disengage the blade-control switch (PTO), move the motion-control levers to the NEUTRAL-LOCK position, 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. Unlatch the seat and tilt the seat up.
4. Remove the battery as shown in Figure 47.

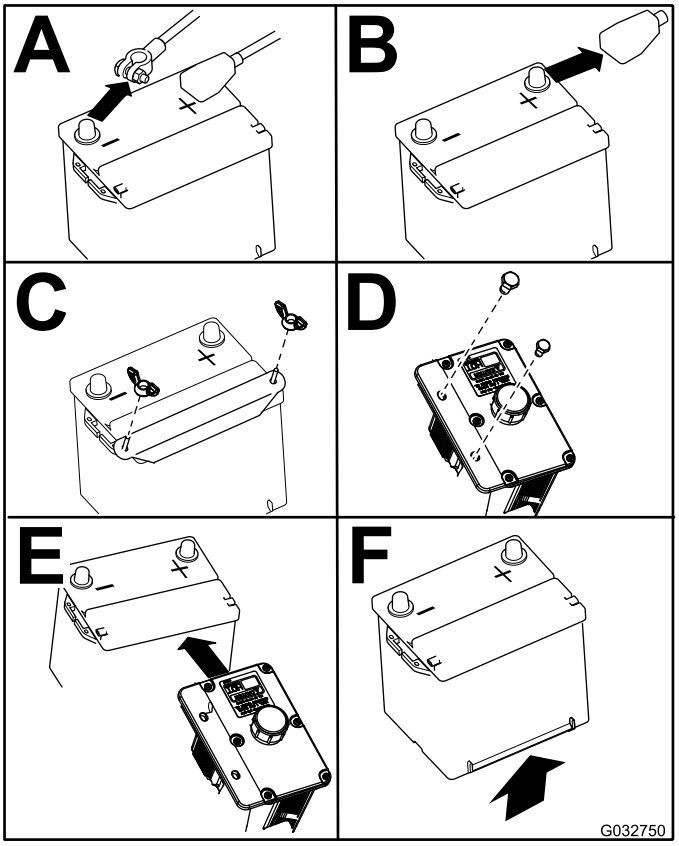


Figure 47

Installing the Battery

Note: Position the battery in the tray with the terminal posts opposite from the hydraulic tank.

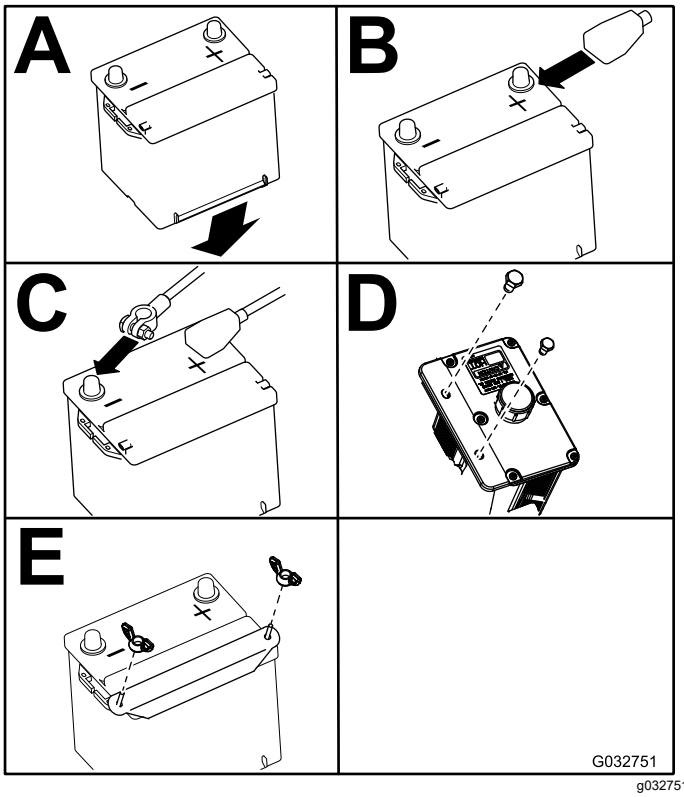


Figure 48

Charging the Battery

Service Interval: Monthly—Check the battery charge.

⚠ WARNING

Charging the battery produces gasses that can explode.

Never smoke near the battery and keep sparks and flames away from 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. Make sure that the filler caps are installed in battery. Charge battery for 10 to 15 minutes at 25 to 30 A or 30 minutes at 10 A.
2. When the battery is fully charged, unplug the charger from the electrical outlet, then disconnect the charger leads from the battery posts (Figure 49).
3. Install the battery in the machine and connect the battery cables, refer to Installing the Battery (page 43).

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

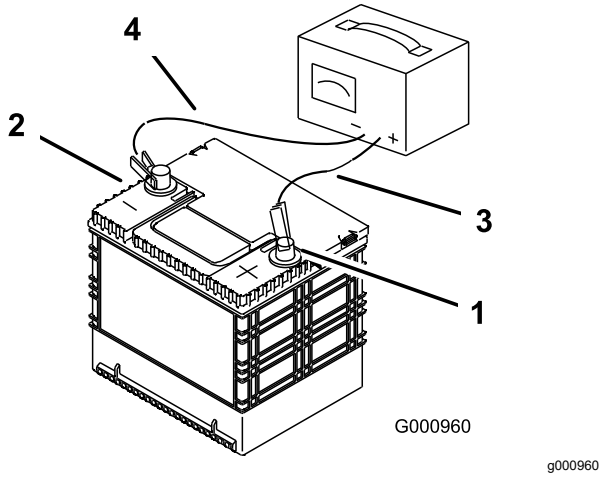


Figure 49

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

Servicing the Fuses

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

1. Unlatch the engine hood and raise the engine hood to gain access to the fuse block.
2. To replace the fuses, pull out on the fuse to remove it.
3. Install a new fuse (Figure 50).

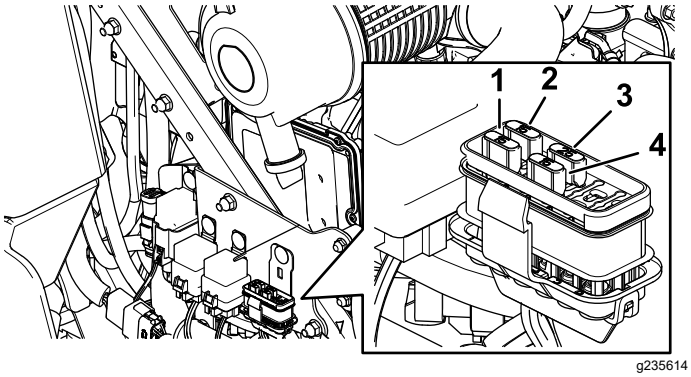


Figure 50

1. Accessory (15 A)
2. Chassis (15 A)
3. Main (25 A)
4. Power point (15 A)

Drive System Maintenance

Releasing the Drive Wheel Release Valves

Use the drive wheel release valves to release the hydrostatic drive system, which allows you to push the machine without the running the engine.

Rotate each bypass valve counterclockwise 1 turn to release; rotate each bypass valve clockwise to reset system (Figure 51).

Important: **Do not overtighten. Do not tow the machine.**

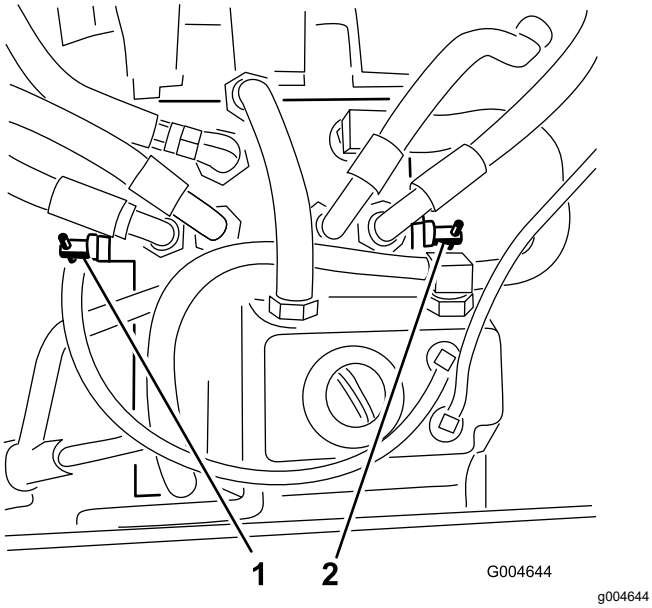


Figure 51

1. Right bypass valve
2. Left bypass valve

Adjusting the Tracking

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. Move the throttle midway between FAST and Slow.
4. Move both motion-control levers all the way forward until they both hit the stops in the T-slot.
5. Check which way the machine tracks.
   - If it tracks to the right, loosen the bolts and adjust the left stop plate rearward on the left T-slot until the machine tracks straight (Figure 52).
   - If it tracks to the left, loosen the bolts and adjust the right stop plate rearward on the right T-slot until the machine tracks straight (Figure 52).
6. Tighten the stop plate (Figure 52).

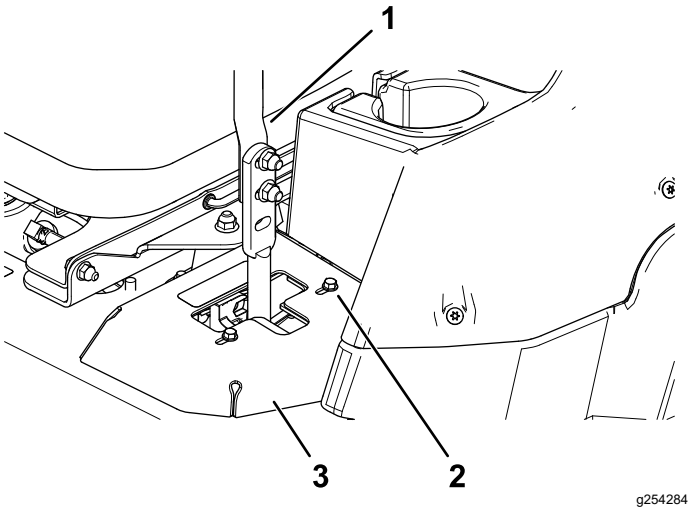


Figure 52

1. Control lever
2. Bolt
3. Stop plate

7. Align the levers in the front-to-rear position by bringing the levers together to the NEUTRAL position, and slide them until they are aligned, then tighten the bolts (Figure 53).

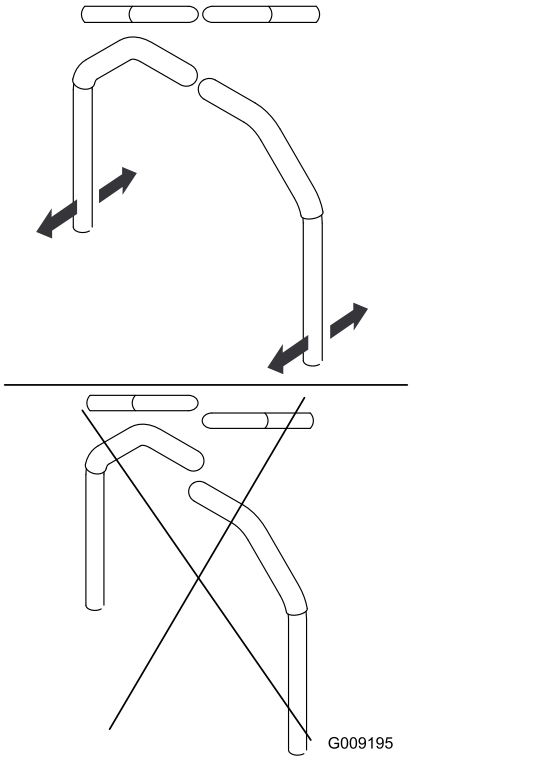


Figure 53

8. If alignment is needed, loosen the 2 motion-control lever mounting bolts on the misaligned side (Figure 54).

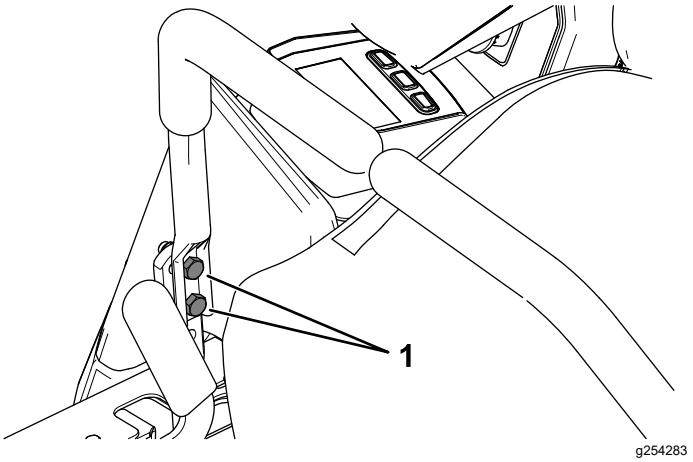


Figure 54

9. Move motion-control lever to meet the opposite side.
10. Tighten the 2 motion-control lever mounting bolts (Figure 54).

Checking the Tire Pressure

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

Rear tire air pressure specification: 124 kPa (18 psi).

Note: The caster tires are semi-pneumatic tires and do not require air pressure maintenance.

⚠ DANGER

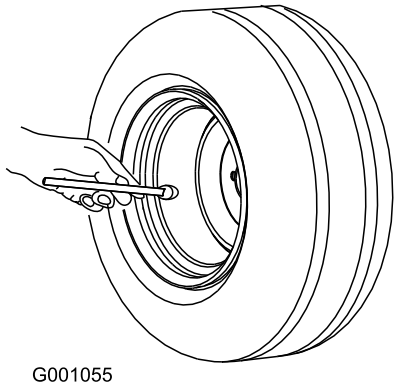
Low tire pressure decreases machine side-hill stability. This could cause a rollover, which may result in personal injury or death.

Do not under-inflate the tires.

Check the air pressure in the rear tires. Add or remove air as needed to set the air pressure in the tires to the tire air pressure specification.

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

Check the air pressure in all the tires before operating the machine.



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Figure 55

Checking the Wheel Lug Nuts

Service Interval: After the first 100 hours—Check the wheel lug nuts.

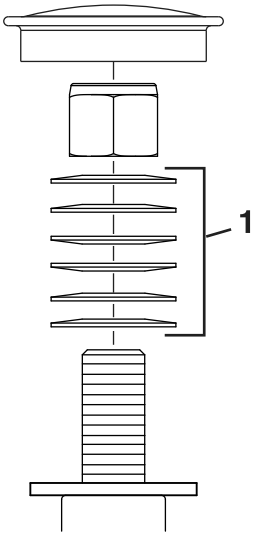
Torque the wheel lug nuts to 115 to 142 N·m (85 to 105 ft-lb).

Adjusting the Caster-Pivot Bearing

Service Interval: Every 500 hours/Yearly (whichever comes first)

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. Remove the dust cap from the caster and tighten the locknut (Figure 56).
4. Tighten the locknut until the spring washers are flat, and then back off a 1/4 turn to properly set the preload on the bearings (Figure 56).

   Important: **Make sure that the spring washers are installed correctly as shown in Figure 56.**
5. Install the dust cap (Figure 56).



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Figure 56

1. Spring disc washers

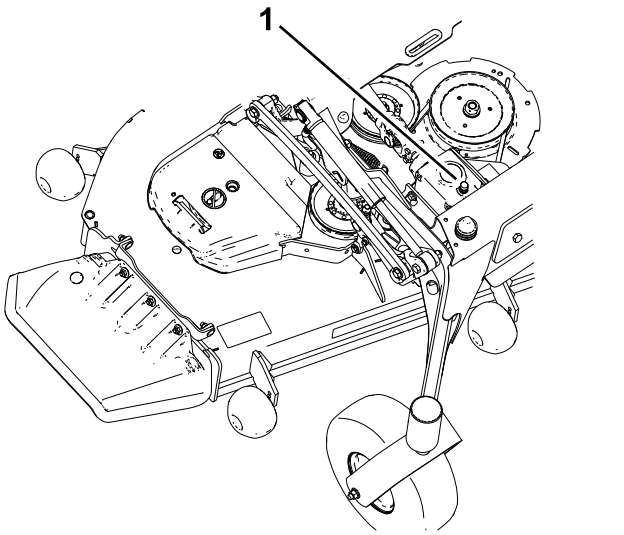
Servicing the Gearbox

Checking the Gearbox-Oil Level

Service Interval: Every 50 hours

Use SAE 75W-90 synthetic gear lube.

1. Park the machine on a level surface and engage the parking brake.
2. Lower the mower deck to the 25 mm (1 inch) height of cut.
3. Disengage the blade-control switch, shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
4. Lift the footrest to expose the top of the mower deck.
5. Remove the dipstick/fill plug from the top of the gearbox and ensure that the lubricant is between the marks on the dipstick (Figure 57).



g231764

Figure 57

1. Fill plug/dipstick

6. If the oil level is low, add enough lubricant until the level is between the marks on the dipstick.

   Important: **Do not overfill the gearbox; overfilling the gearbox may damage it.**

Changing the Gearbox Oil

Service Interval: After the first 200 hours

Every 400 hours

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

1. Park the machine on a level surface and engage the parking brake.
2. Lower the mower deck to the 25 mm (1 inch) height of cut.
3. Disengage the blade-control switch, shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
4. Lift the footrest to expose the top of the mower deck.
5. Remove the dipstick/fill plug from the top of the gearbox and ensure that the lubricant is between the marks on the dipstick (Figure 57).
6. Extract the oil through the fill port using a vacuum device or remove the gearbox from the deck and pour out the oil into a drain pan.
7. Install the gearbox (if it was removed to drain).
8. Add approximately 420 ml (14 fl oz), until the level is between the marks on the dipstick

   Important: **Do not overfill the gearbox; overfilling the gearbox may damage it.**

Cooling System Maintenance

Cooling System Safety

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

Checking the Cooling System

Service Interval: Before each use or daily

Coolant specification: 50/50 solution of water and permanent ethylene-glycol antifreeze

Cooling-system capacity: 7.6 L (8 US qt)

1. Open the hood.
2. Check the level of the coolant in the expansion tank (Figure 58).

   Note: The coolant level should be between the marks on the side of the tank.

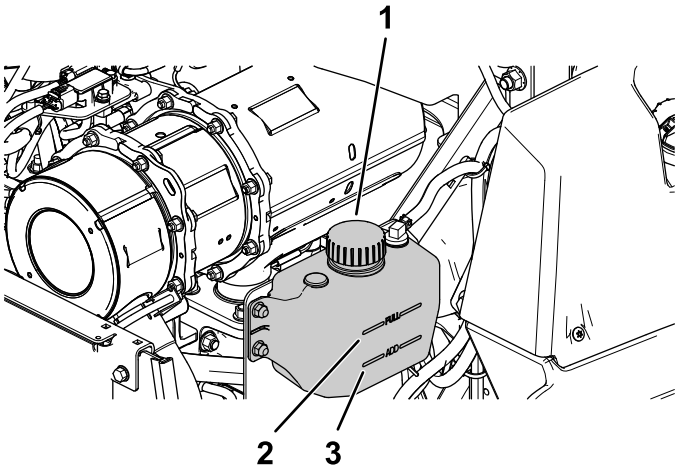


Figure 58

1. Expansion-tank cap
2. Full line
3. Add line

3. If coolant level is low, remove the expansion-tank cap, and add the specified coolant (Figure 58).

   Important: **Do not overfill.**
4. Install the expansion-tank cap.
5. Close the hood.

Cleaning the Radiator

Service Interval: Every 50 hours—Clean the engine-cooling system (more often in dirty and dusty conditions).

Clean the radiator to prevent the engine from overheating.

Note: If the mower deck or engine shuts off due to overheating, check the radiator for excessive buildup of debris.

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. Rotate the hood forward.
4. Using compressed air, blow out debris stuck between the fins of the entire radiator, both from the top down and bottom up.
5. If debris remains, it may be necessary to use water from a low-pressure hose.

   If the radiator is clean, proceed to step 7.
6. Cover the engine with a piece of cardboard or a plastic sheet. Squirt water through the fins. Blow through with low-pressure air from both directions.

   Note: If debris remains, repeat until clean.
7. Lower the hood.
8. Start the engine to ensure that the fan functions properly.

Changing the Engine Coolant

Service Interval: Every 2,000 hours/Every 2 years (whichever comes first)

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. Rotate the hood forward.
4. Drain the coolant when the engine is cool.
5. Remove the radiator cap, place a pan under the radiator, and remove the drain plug at the bottom of the radiator.

6. Remove the coolant hose from the oil cooler and drain the coolant from the engine block (Figure 59).

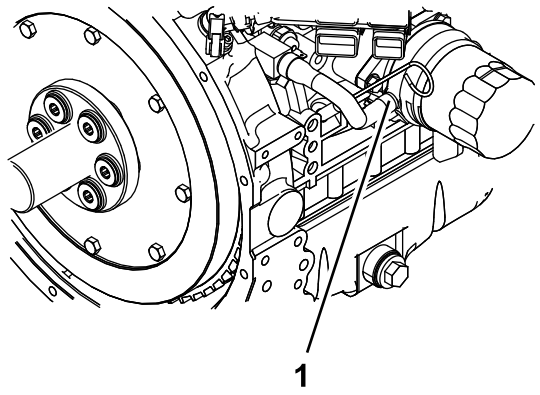


Figure 59

1. Coolant hose

7. Install the drain plugs and hoses.
8. Fill radiator with a 50/50 mix of water and ethylene glycol.

   Note: The use of Havoline® Xtended Life coolant is recommended.

   Allow some room (approximately 12.7 mm (1/2 inch)) for expansion. Add 50/50 coolant mix to the overflow bottle on the left side of the engine as required to bring the level up to the indicator line on the bottle.
9. Operate engine until the engine thermostat opens and the coolant is circulating through the radiator core.

   As air purges from the engine block and the coolant level drops, add additional coolant to the radiator.
10. When the radiator is completely full and no additional coolant can be added, continue running and install the radiator cap.

    Ensure that the cap is completely seated by pressing down firmly while turning, until the cap stops. Once the cap is installed, shut off the engine.

Brake Maintenance

Adjusting the Parking Brake

Service Interval: After the first 100 hours

Every 400 hours

Check to ensure that parking brake is adjusted properly. Follow this procedure also whenever you have removed or replaced a brake component.

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 rear of the machine up and support the machine with jack stands.
4. Remove the rear tires from the machine.
5. Remove any debris from the brake area.
6. Release the drive wheels; refer to Releasing the Drive Wheel Release Valves (page 44).
7. Measure the length of the link assembly (Figure 60).

   Note: If the link assembly is attached in the **front** position, the length should be 219 mm (8-5/8 inches); if it is attached in the **rear** position, the length should be 232 mm (9-1/8 inches).

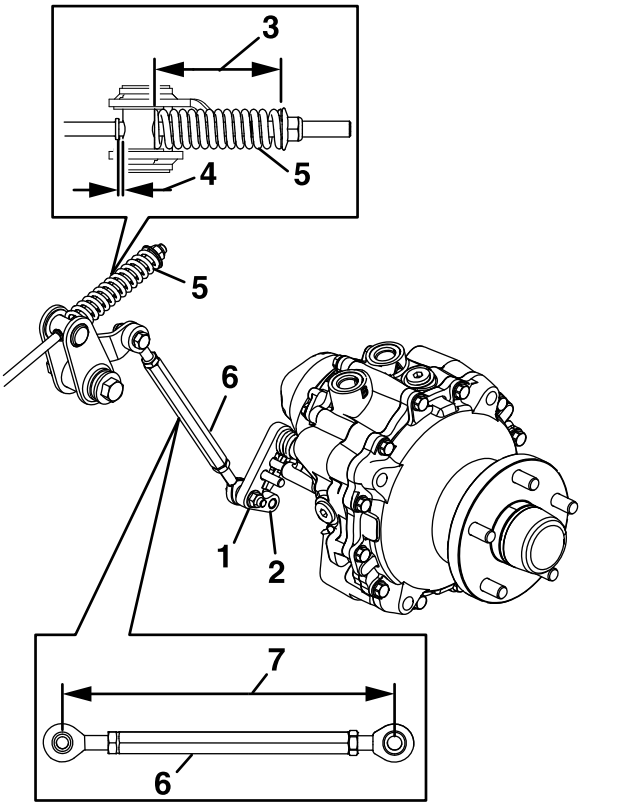


Figure 60

1. Front location
2. Rear location
3. 95 mm (3-3/4 inches)
4. Gap
5. Spring
6. Link assembly
7. Length

8. Measure the length of the spring (Figure 60).

   Note: The measurement should be 95 mm (3-3/4 inches).

9. When you achieve the correct spring length, check to see if there is a visible gap between the trunion and the shoulder.
10. Disengage the parking brake and turn the wheel hub by hand in both directions.

    Note: The wheel hub should move freely.

11. If a gap is needed or the wheel hub does move freely, do the following:
    A. Disengage the parking brake.
    B. Disconnect and fine-tune the rear linkage assembly.
       - Shorten the link to create a gap.
       - Lengthen the link to allow wheel hub movement.
    C. Connect the rear linkage assembly.
12. Engage the parking brake and check the gap.
13. Repeat steps 10 through 12 until a visible gap is achieved and the wheel hub rotates freely. Repeat this procedure for the other side.

    Note: The brake should fully disengage when the brake is in the released position.

14. Rotate the drive wheel release handle to the operating position; refer to Releasing the Drive Wheel Release Valves (page 44).
15. Install the rear tires and torque the lug nuts to 115 to 142 N·m (85 to 105 ft-lb).
16. Remove the jack stands.

Belt Maintenance

Inspecting the Belts

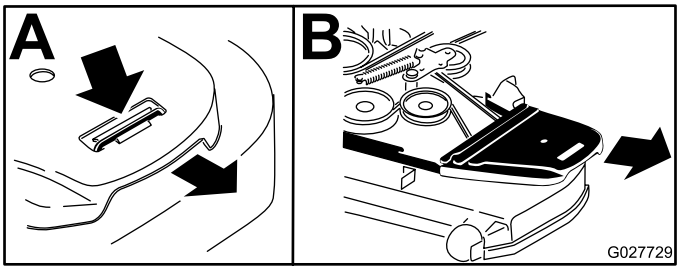
Service Interval: Every 50 hours

Check the belts whenever they squeal while rotating, the blades slip while cutting grass, or if the belts have frayed edges, burn marks, or cracks. If any of these conditions occur, replace the belts.

Replacing the Mower Belt

Squealing when the belt is rotating, blades slipping when cutting grass, frayed belt edges, burn marks and cracks are signs of a worn mower belt. Replace the belt if any of these conditions are evident.

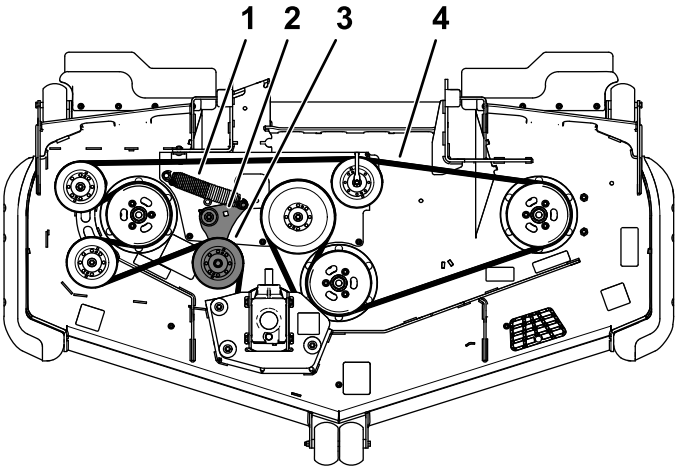
1. Park the machine on a level surface, disengage the blade-control switch, and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Lower the mower to the 76 mm (3 inches) height of cut.
4. Remove the belt covers (Figure 61).



g027729

Figure 61

5. Use a ratchet in the square hole in the idler arm to remove tension on the idler spring (Figure 62 or Figure 63).
6. Remove the belt from the mower-deck pulley.
7. Install the new belt around the mower pulleys (Figure 62 or Figure 63).

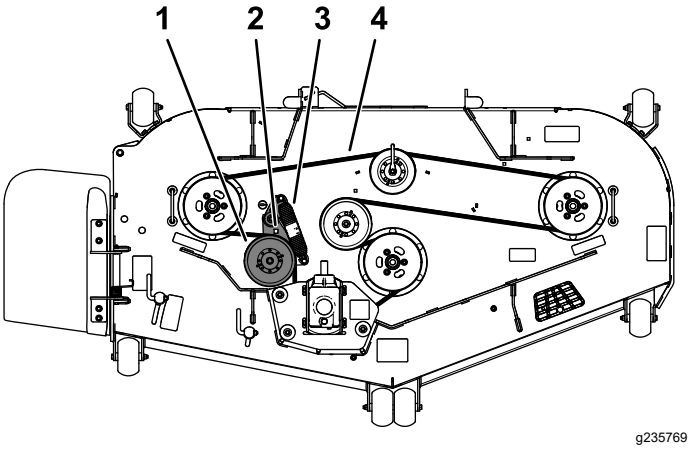


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Figure 62

Rear Discharge Machine Shown

1. Spring
2. Square hole in the idler arm for the ratchet
3. Spring-loaded idler pulley
4. Mower belt



g235769

Figure 63

Side Discharge Machine Shown

1. Spring-loaded idler pulley
2. Square hole in the idler arm for the ratchet
3. Spring
4. Mower belt

8. Ensure that the spring ends are seated in the anchor grooves, and using the ratchet in the square hole, install the belt around the idler pulley (Figure 62 or Figure 63).
9. Install the belt covers (Figure 64).

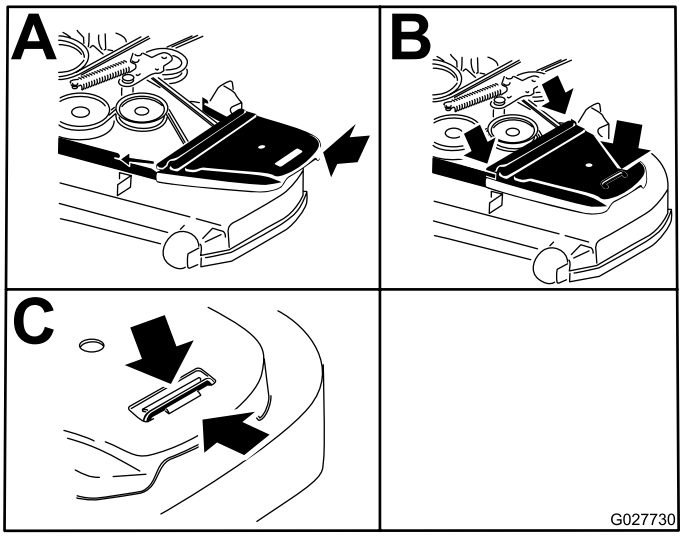


Figure 64

Checking the Alternator-Belt Tension

Service Interval: Every 100 hours

1. Apply 44 N (10 lb) of force to the alternator belt, midway between the pulleys.
2. If the deflection is not 10 mm (3/8 inch), loosen the alternator mounting bolts (Figure 65).

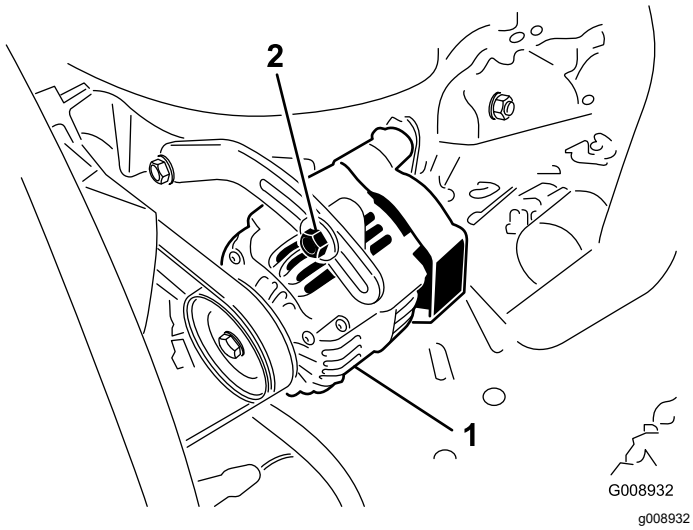


Figure 65

1. Mounting bolt
2. Alternator

3. Increase or decrease the alternator-belt tension.
4. Tighten the mounting bolts.
5. Check the deflection of the belt again to ensure that the tension is correct.

Controls System Maintenance

Adjusting the Control-Handle Position

There are 2 height positions for the control levers—high and low. Remove the bolts to adjust the height for the operator.

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. Loosen the bolts and flange nuts installed in the levers (Figure 66).
4. Align the levers in the front-to-rear position by bringing the levers together to the NEUTRAL position, and slide them until they are aligned, then tighten the bolts (Figure 67).

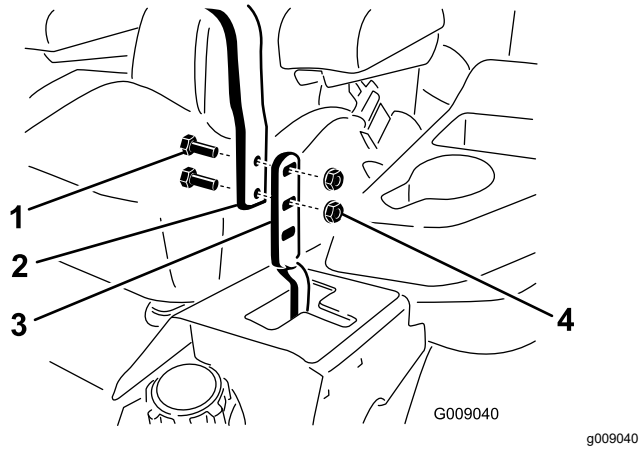
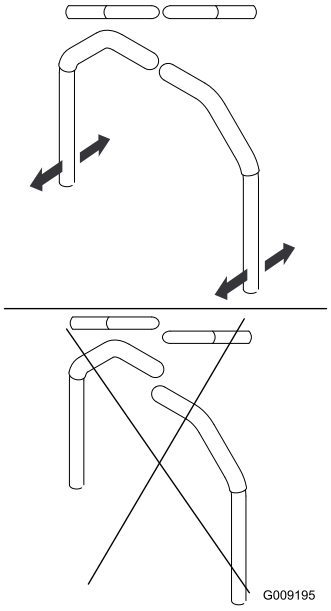


Figure 66

1. Bolt
2. Handle
3. Control lever
4. Nut



g009195

Figure 67

5. If the ends of the levers hit against each other, repeat this procedure.

Adjusting the Motion-Control Linkage

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

⚠ WARNING

To adjust the motion control, you must run the engine and turn the drive wheels. Contact with moving parts or hot surfaces may cause personal injury.

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

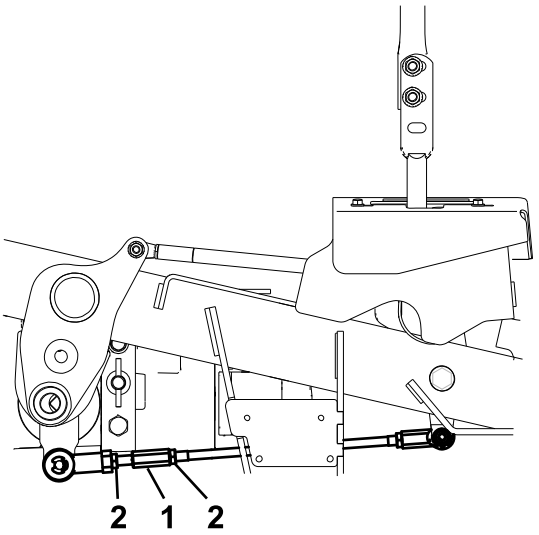
1. Prior to starting the engine, push the deck-lift pedal, and remove the height-of-cut pin.
2. Lower deck to the ground.
3. Raise the rear of machine up and support it with jack stands (or equivalent support).

   Note: Raise the machine just high enough to allow the drive wheels to turn freely.
4. 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.
5. **Temporarily** install a jumper wire across the terminals in the connector of the main wire harness.
6. Start the engine and run it at full throttle and disengage the brake.

   Note: You do not need to be in the seat because the jumper wire is being used.
7. Run the unit for 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 needs to be in neutral while making any necessary adjustments.
8. Bring the motion-control levers into the NEUTRAL position.
9. Adjust the pump control rod lengths by rotating the double nuts on the rod in the appropriate direction until the wheels slightly creep in reverse (Figure 68).



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Figure 68

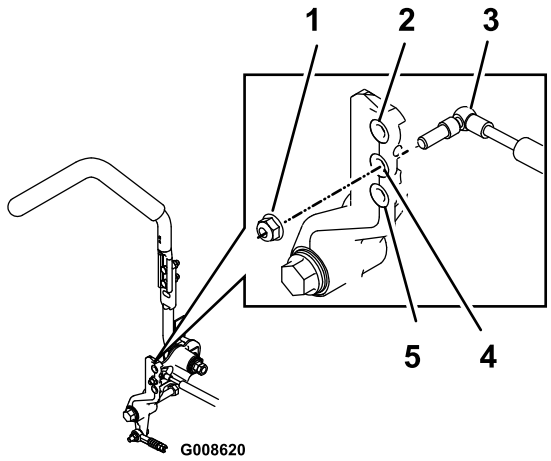
1. Turn here to adjust.
2. Loosen here (right-hand thread).

10. 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 must stop turning or slightly creep in reverse.
11. Shut off the machine, remove the jumper wire from the wire harness, and plug the connector into the seat switch.
12. Remove the jack stands.
13. Raise the deck and install the height-of-cut pin.
14. Check that the machine does not creep in neutral with the park brakes disengaged.

Adjusting the Motion-Control Damper

You can adjust the top damper-mounting bolt to obtain the desired motion-control lever resistance. Refer to Figure 69 for mounting options.



g008620

Figure 69

Right Motion Control Shown

1. Torque the locknut to 23 N-m (17 ft-lb). The bolt must protrude past the end of the locknut after torquing.
2. Most resistance (firmest feel)
3. Damper
4. Medium resistance (medium feel)
5. Least resistance (softest feel)

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.

Servicing the Hydraulic System

Hydraulic-Fluid Specifications

Hydraulic-tank capacity: 15.1 L (16 US qt)

Recommended fluid: Toro Premium Transmission/Hydraulic Tractor Fluid (available in 5-gallon pails or 55-gallon drums. See the *Parts Catalog* or contact an authorized Toro distributor for part numbers.)

Alternate fluids: If the Toro fluid is not available, Mobil® 424 hydraulic fluid may be used.

Note: Toro does not assume responsibility for damage caused by improper substitutions.

Note: Many hydraulic fluids are almost colorless, making it difficult to spot leaks. A red dye additive for the hydraulic-system fluid is available in 20 ml (2/3 fl oz) bottles. 1 bottle is sufficient for 15 to 22 L (4 to 6 gallons) of hydraulic fluid. Order Part Number 44-2500 from your authorized Toro distributor.

Checking the Hydraulic-Fluid Level

Service Interval: Before each use or daily

Check the hydraulic-fluid level before you first start the engine and daily thereafter.

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

2. Move the motion-control levers to the NEUTRAL-LOCK position and start the engine.

   Note: Run the engine at the lowest possible rpm to purge any air in the system.

   Important: **Do not engage the PTO.**

3. Raise the deck to extend the lift cylinders, shut off the engine, and remove the key.
4. Raise the seat to access the hydraulic-fluid tank.
5. Remove the hydraulic-tank cap (Figure 70).

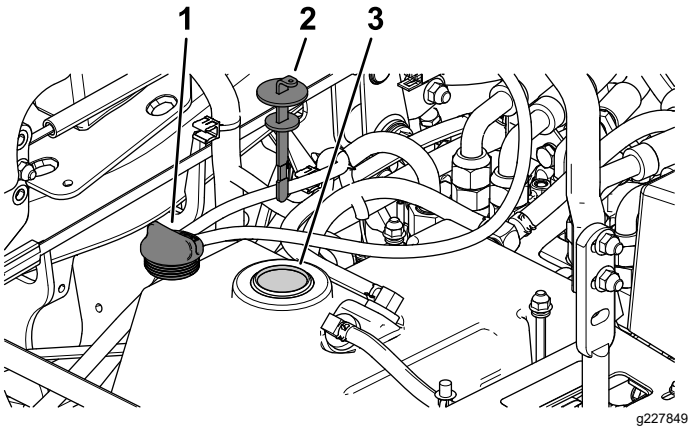


Figure 70

1. Hydraulic-tank cap
2. Dipstick
3. Filler neck

6. Remove the dipstick and wipe it with a clean rag (Figure 70).
7. Place the dipstick into the filler neck, remove it, and check the fluid level (Figure 71).

   Note: If the level is not within the notched area of the dipstick, add enough high-quality hydraulic fluid to raise the level to within the notched area.

   Important: **Do not overfill.**

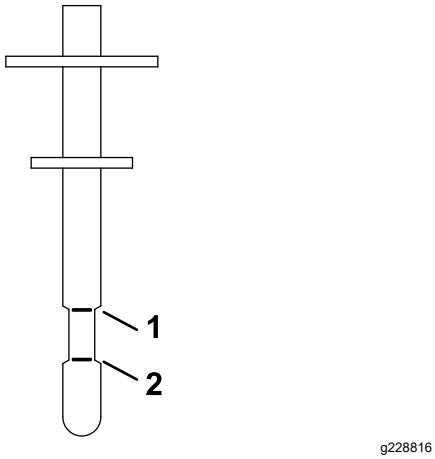


Figure 71

1. Full line
2. Add line

8. Replace the dipstick and thread the fill cap finger-tight onto the filler neck.
9. Check all hoses and fittings for leaks.

Changing the Hydraulic Fluid and Filter

Service Interval: After the first 200 hours—Change the hydraulic fluid and filter.

Every 400 hours—Change the hydraulic fluid and filter if using Mobil® 424 hydraulic fluid.

Every 800 hours—Change the hydraulic fluid and filter if using Toro Premium Transmission/Hydraulic Tractor Fluid.

1. Disengage the PTO, move the motion-control levers to the NEUTRAL-LOCK position, and engage the parking brake.
2. Move the throttle lever to the SLOW position, shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Raise the seat.
4. Place a large drain pan under the hydraulic reservoir, transmission case, and the left and right wheel motors (Figure 72).

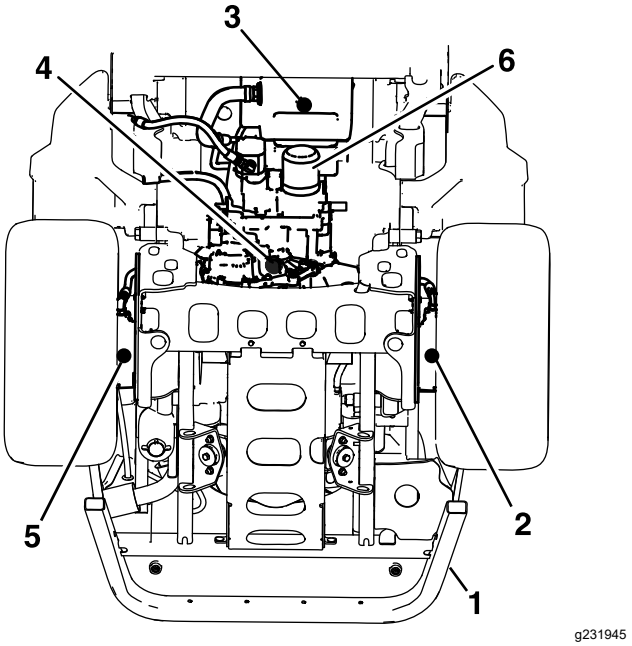


Figure 72

1. Rear frame
2. Left wheel motor drain plug
3. Hydraulic reservoir drain plug
4. Transmission case drain plug
5. Right wheel motor drain plug
6. Hydraulic-fluid filter

5. Remove the drain plugs from each area and allow the hydraulic fluid to drain (Figure 72).

6. Clean the area around the hydraulic-fluid filter and remove the filter (Figure 72).
7. Install a new hydraulic-fluid filter and turn the filter clockwise until the rubber seal contacts the filter adapter, then tighten the filter an additional 2/3 to 3/4 turn.
8. Install the 4 drain plugs.

   Note: The wheel motor drain plugs are magnetic; wipe them clean before installing.
9. Remove the fill-port plug on the top of each wheel motor (Figure 73).

   A. Fill each wheel motor with approximately 1.4 L (1.5 US qt) of Toro Premium Transmission/Hydraulic Tractor Fluid.

   B. Install the fill-port plugs.

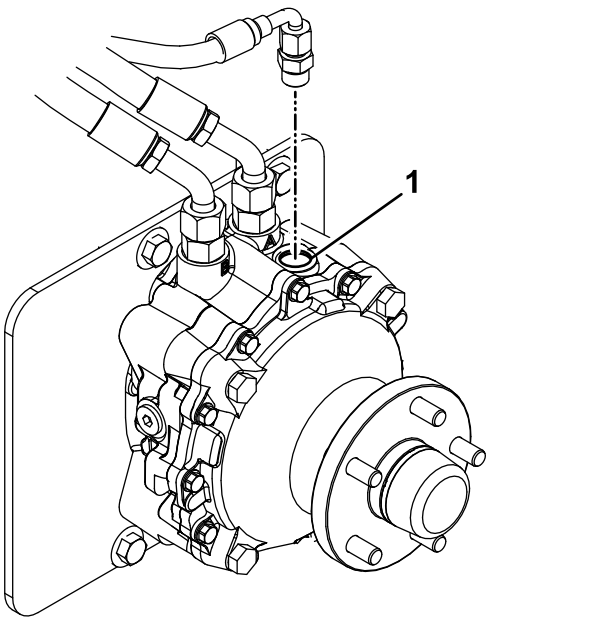


Figure 73

1. Fill port

10. Remove the reservoir cap and dipstick from the hydraulic-fluid tank.
11. Add 7.6 L (8 US qt) of fluid to the reservoir.
12. Raise the rear of machine up and support it with jack stands (or equivalent support) just high enough to allow the drive wheels to turn freely.
13. Start the engine and check for fluid leaks.

    Allow the engine to run for about 5 minutes, then shut it off.
14. After 2 minutes, check the level of the hydraulic fluid; refer to Checking the Hydraulic-Fluid Level (page 54).

Mower Deck Maintenance

Leveling the Mower Deck

Setting up the Machine

Note: Ensure that the mower deck is level before matching the height of cut (HOC).

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. Check tire pressure of the drive tires.

   If needed, adjust to 124 kPa (18 psi).
4. Position the mower to the 76 mm (3 inches) height-of-cut position.

Leveling the Deck

1. Position the machine on a flat surface.
2. Shut off the engine, wait for all moving parts to stop, remove the key, and engage the parking brake.
3. Check the tire pressure in the drive tires.
4. Using the deck-lift switch, move the deck height out of the transport position (or 5-1/2 inches (140 mm) cutting height).

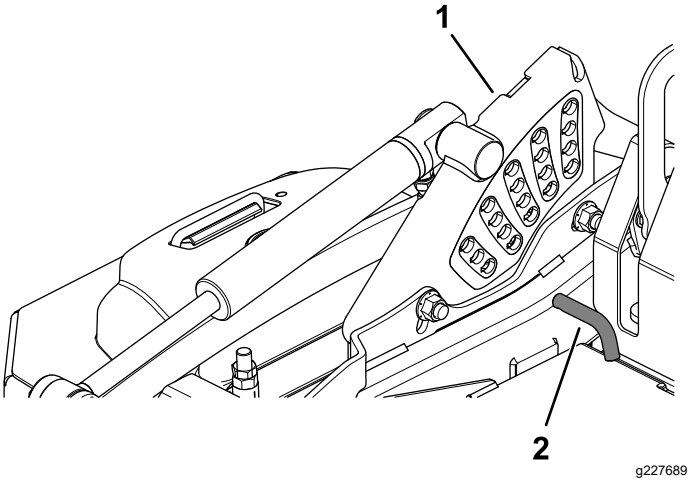


Figure 74

1. Height-of-cut bracket
2. Height-of-cut pin

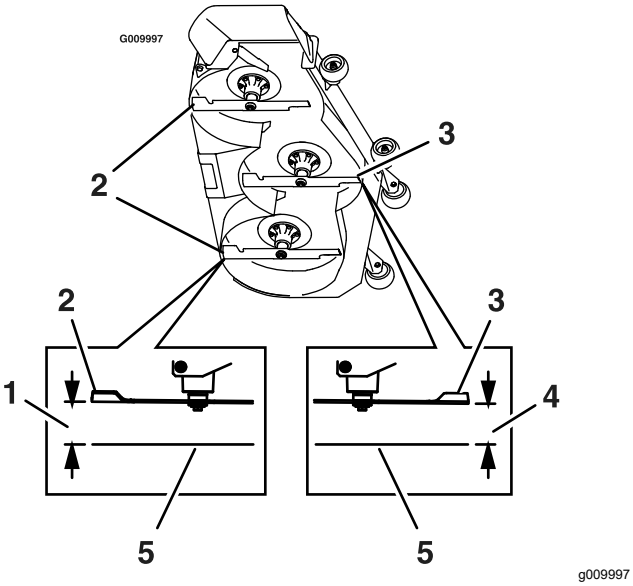
5. Insert the height-adjustment pin into the 76 mm (3 inches) height-of-cut location.
6. Release the transport lock and allow the deck to lower to the cutting height.

7. Raise the discharge deflector (side discharge mowers only).
8. Measure from the level surface to the front tip of the center blade (Figure 75).

   Note: The measurement should read 7.6 mm (3 inches).

   In most conditions, the back tips on the side blades should be adjusted as follows:

   - **Side Discharge Machines:** 6.4 mm (1/4 inch) higher than the front.
   - **Rear Discharge Machines:** should be level with the front.



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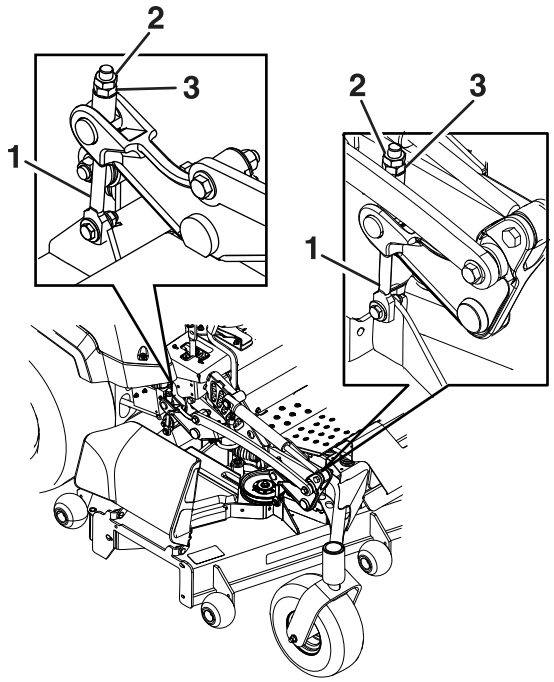
Figure 75

1. Side Discharge: 8.3 cm (3-1/4 inches); Rear Discharge: 7.6 cm (3 inches).
2. Rear blade tip
3. Front blade tip
4. 7.6 cm (3 inches)
5. Level surface

9. Fine-tune the adjustment nut on the front deck lift assembly by turning it (Figure 76).

   Note: To increase the height, turn the adjustment nut clockwise; to decrease, turn counterclockwise.

   Note: If the front deck links do not have enough adjustment to achieve accurate cut height, the single-point adjustment can be utilized to gain more adjustment.



g231991

Figure 76

1. Deck adjustment
2. Jam nut
3. Adjustment nut

10. Measure the rear blade tip height. Fine-tune the rear adjusters as required; the single-point adjustment can be utilized to gain more adjustment.

    - **Side Discharge Machines:** the rear tips of the side blades should measure 8.3 cm (3-1/4 inches).
    - **Rear Discharge Machines:** the rear tips of the side blades should measure 7.6 cm (3 inches).

11. Measure until all 4 sides are the correct height. Tighten all the nuts on the deck-lift arm assemblies.
12. Lower the discharge deflector (side discharge mowers only).
13. If the 4 deck adjusters do not have enough adjustment to achieve the accurate height of cut with the desired rake, you can adjust the single-point system (Figure 77).

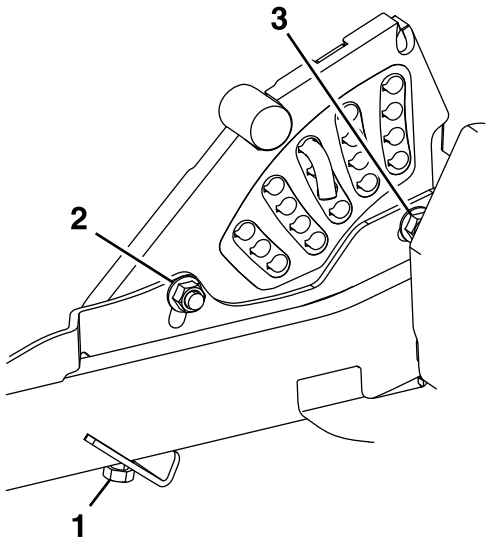


Figure 77

1. Single-point height adjustment bolt
2. Front height-of-cut plate mounting bolt
3. Rear height-of-cut plate mounting bolt

14. To adjust the single-point system, first loosen the front and rear height-of-cut plate mounting bolts (Figure 77).

    Note: Rear Discharge Machines Only: The mower deck is attached in the front holes at the factory (Figure 78). If needed, use the back holes for further adjustment when leveling the mower deck.

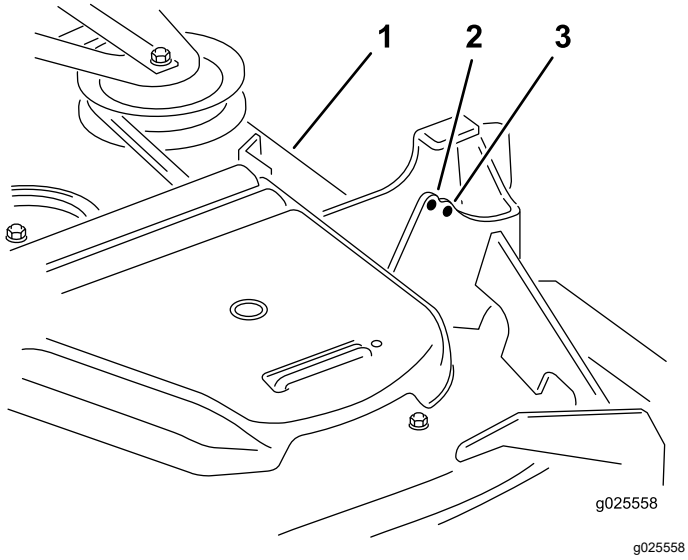


Figure 78

1. Mower deck
2. Front hole
3. Back hole

15. If the deck is too low, tighten the single-point adjustment bolt by rotating it clockwise. If the deck is too high, loosen the single-point adjustment bolt by rotating it counterclockwise (Figure 79).

    Note: Loosen or tighten the single-point adjustment bolt enough to move the height-of-cut plate mounting bolts at least 1/3 the length of the available travel in their slots. This regains some up and down adjustment on each of the 4 deck links.

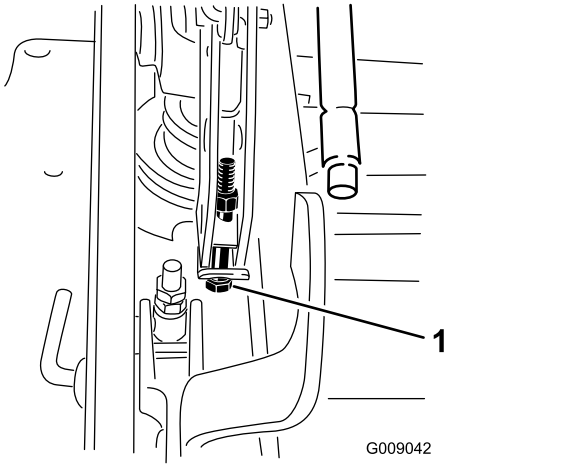


Figure 79

1. Single-point-adjustment bolt

16. Tighten the 2 bolts at the bottom of the height-of-cut plate (Figure 77).

    Note: For most conditions, adjust the black blade tip 6.4 mm (1/4 inch) higher than the front.

17. Torque the 2 bolts to 91 to 113 N·m (67 to 83 ft-lb).

18. Measure until all 4 sides are the correct height. Tighten all the nuts on the deck lift arm assemblies.

Servicing the Cutting Blades

To ensure a superior quality of cut, keep the blades sharp. For convenient sharpening and replacement, keep extra blades on hand.

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.

Before Inspecting or Servicing the Blades

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.

Inspecting the Blades

Service Interval: Before each use or daily

1. Inspect the cutting edges (Figure 80).
2. If the edges are not sharp or have nicks, remove and sharpen the blade; refer to Sharpening the Blades (page 61).
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 80).

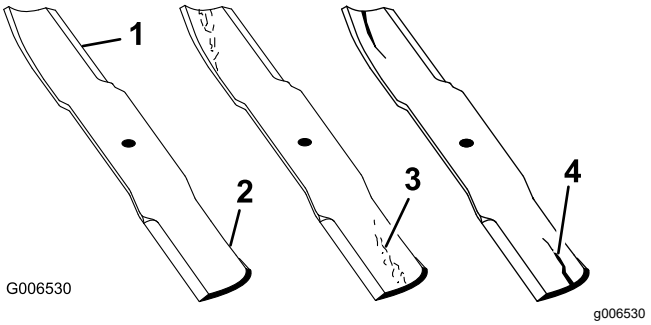


Figure 80

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

Checking for Bent Blades

1. Disengage the blade-control switch (PTO), move the motion-control levers to the NEUTRAL-LOCK position, 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. Rotate the blades until the ends face forward and backward (Figure 81).
4. Measure from a level surface to the cutting edge, position **A**, of the blades (Figure 81).

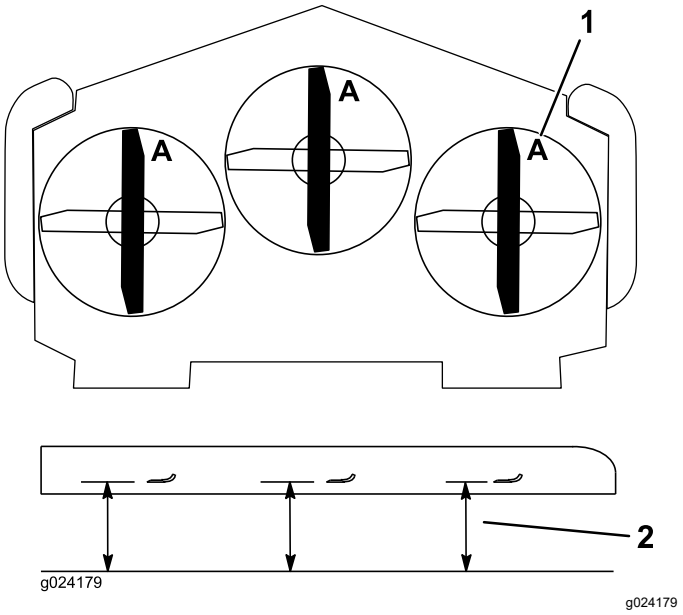


Figure 81

1. Measure here from the blade to a hard surface
2. Position A

5. Rotate the opposite ends of the blades forward.
6. Measure from a level surface to the cutting edge of the blades at the same position as in step 4.

Note: The difference between the dimensions obtained in steps 4 and 5 must not exceed 3 mm (1/8 inch).

Note: If this dimension exceeds 3 mm (1/8 inch), the blade is bent and must be replaced.

⚠ DANGER

A blade that is bent or damaged could break apart and could seriously injure or kill you or bystanders.

- **Always replace bent or damaged blade with a new blade.**
- **Never file or create sharp notches in the edges or surfaces of blade.**

Removing the Blades

Replace a blade if it hits an object, if the blade is out of balance, or if the blade is bent. To ensure optimum performance and continued safety conformance of the machine, use genuine Toro replacement blades. Replacement blades made by other manufacturers may result in nonconformance with safety standards.

1. Hold the blade end using a rag or a thickly padded glove.
2. Remove the left and center blade bolt, curved washer, and blade from the spindle shaft (Figure 82).
3. Remove the right blade bolt (left-hand threaded bolt), curved washer, and blade from the spindle shaft (Figure 83).

   Note: Make note of the type blade and where each blade is installed. See Figure 83 for the correct position.

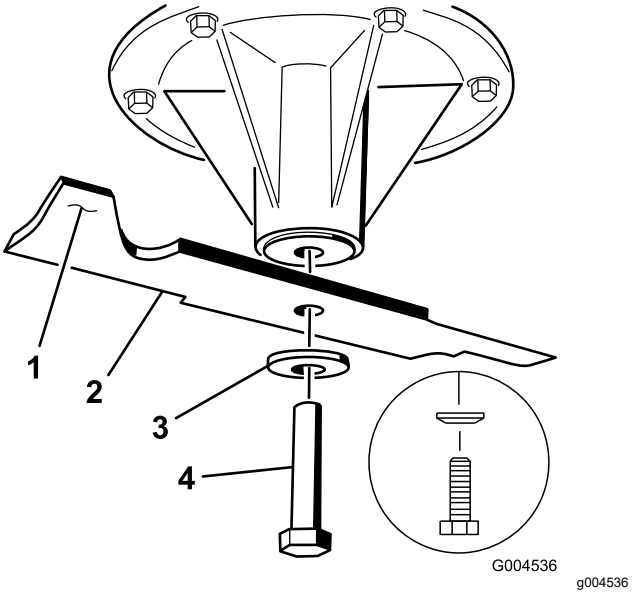


Figure 82
Left and Center Spindle Shown

1. Sail area of the blade
2. Blade
3. Curved washer
4. Blade bolt

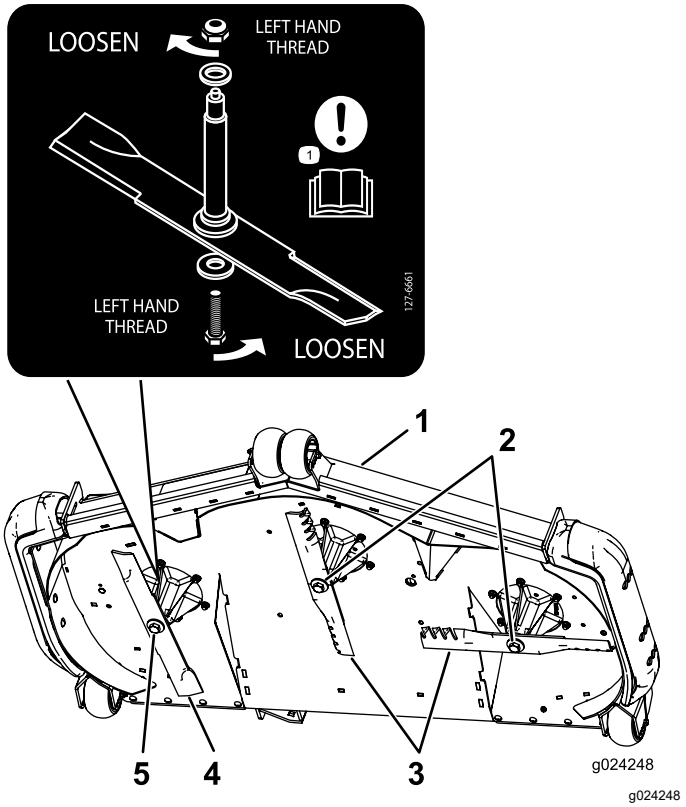


Figure 83
Blade Location

1. Front of mower deck
2. Right-hand threaded blade bolts
3. Regular blades
4. Counter-rotating blade
5. Left-hand threaded blade bolt

Sharpening the Blades

1. Use a file to sharpen the cutting edge at both ends of the blade (Figure 84).

   Note: Maintain the original angle.

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

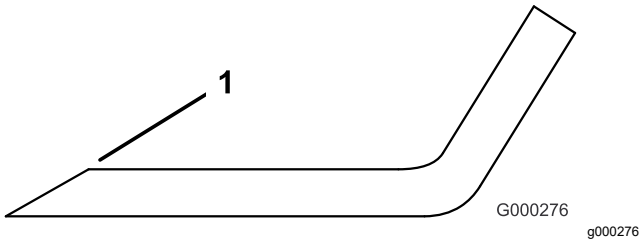


Figure 84

1. Sharpen at original angle.

2. Check the balance of the blade by putting it on a blade balancer (Figure 85).

   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 84).

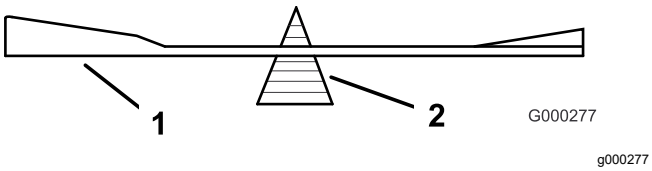


Figure 85

1. Blade
2. Balancer

3. Repeat this procedure until the blade is balanced.

Installing the Blades

Important: **The right blade on this mower deck is counter-rotating and uses a left-hand threaded blade bolt. Use Figure 87 for the correct placement of the mower blades.**

1. Install the left and center blades, curved washers, and blade bolts to the spindle shafts (Figure 86 and Figure 87).

   Note: Ensure the curved part of the blade is pointing upward toward the inside of the mower deck to ensure proper cutting.

   Note: Ensure the curved-washer cone is installed toward the bolt head (Figure 86).

2. Install the right blade, curved washer, and blade bolt (left-hand threaded bolt) to the spindle shaft (Figure 86 and Figure 87).

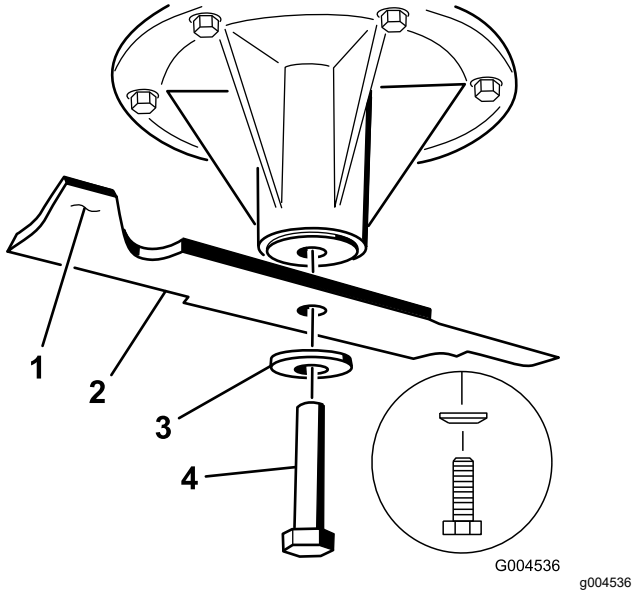


Figure 86

Left and center spindle shown

1. Sail area of the blade
2. Blade
3. Curved washer
4. Blade bolt

3. Torque the blade bolts to 115 to 150 N·m (85 to 110 ft-lb); refer to Figure 87.

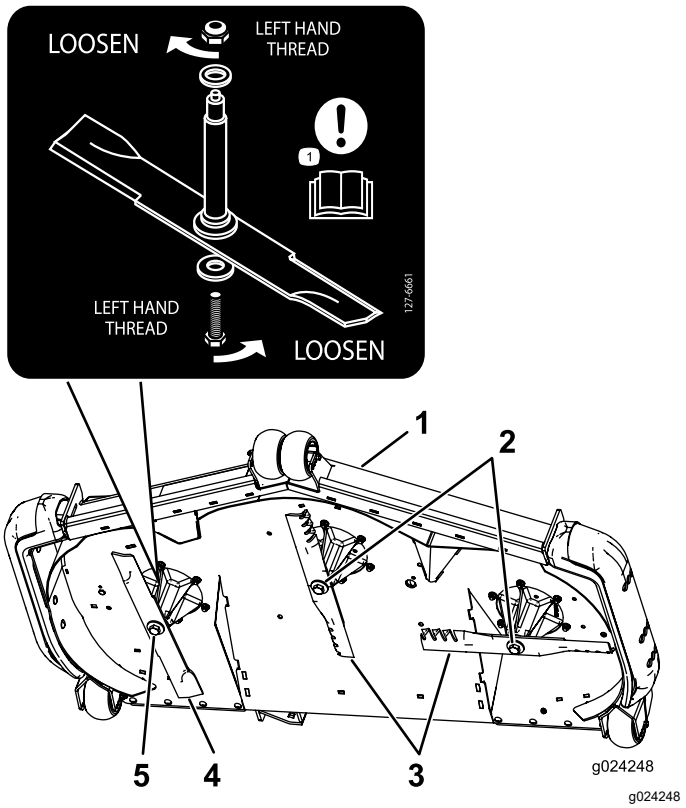


Figure 87

1. Front of mower deck
2. Right-hand threaded blade bolts
3. Regular blades
4. Counter-rotating blade
5. Left-hand threaded blade bolt

Replacing the Grass Deflector

Side Discharge Machines Only

⚠ 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 cover plate, mulch plate, grass deflector, or bagger.

1. Remove the locknut, bolt, spring, and spacer holding the deflector to the pivot brackets (Figure 88).

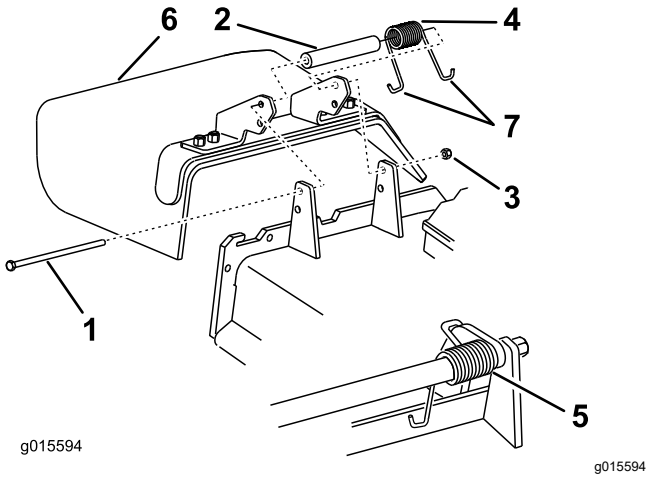


Figure 88

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

2. Remove damaged or worn grass deflector.
3. Place spacer and spring onto the grass deflector. Place a **J**-end of spring behind deck edge.

   Note: Ensure that a **J**-end of spring is installed behind deck edge before installing the bolt as shown in Figure 88.
4. Install the bolt and nut.
5. Place a **J**-hook end of spring around grass deflector (Figure 88).

   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 the Engine and Exhaust System Area

Service Interval: Before each use or daily—Clean the engine and exhaust system area.

Important: **Do not use water to clean the engine. Use low-pressure compressed air. See the engine owner's manual.**

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 around the flywheel, cylinder head, injectors, and injector pump.
4. Clean all debris from the exhaust system area.
5. Wipe up any excessive grease or oil around the engine and exhaust area.

Cleaning the Machine and 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. Clean off any oil, debris, or grass build-up on the machine and mower deck, especially under the deck-belt shields, around the fuel tank, and around the engine and exhaust area.
4. Raise the mower deck to the TRANSPORT position.
5. Clean out any grass build-up from the underside of deck and in the discharge deflector.

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

- Let the engine cool before storing the machine.
- Do not store the machine or fuel near flames or drain the fuel indoors.

Cleaning and Storing the Machine

1. Disengage the blade-control switch (PTO), engage the parking brake, turn the ignition key to the OFF position, and remove the key.
2. 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.**
3. Check the brake; refer to Brake Maintenance (page 49).
4. Service the air cleaner; refer to Servicing the Air Cleaner (page 38).
5. Grease the machine; refer to Lubrication (page 36).
6. Change the engine oil and filter; refer to Changing the Engine Oil and Filter (page 40).
7. Check the tire pressure; refer to Checking the Tire Pressure (page 46).
8. Change the hydraulic fluid and filter; refer to Changing the Hydraulic Fluid and Filter (page 55).
9. Charge the battery; refer to Charging the Battery (page 43).
10. 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.
11. Check the condition of the blades; refer to Servicing the Cutting Blades (page 59).

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

    A. Run the engine to distribute conditioned fuel through the fuel system for 5 minutes.

    B. Shut off the engine, allow it to cool, and drain the fuel tank.

    Note: Start the engine and run it until it shuts off.

    C. Dispose of fuel properly. Recycle as per local codes.

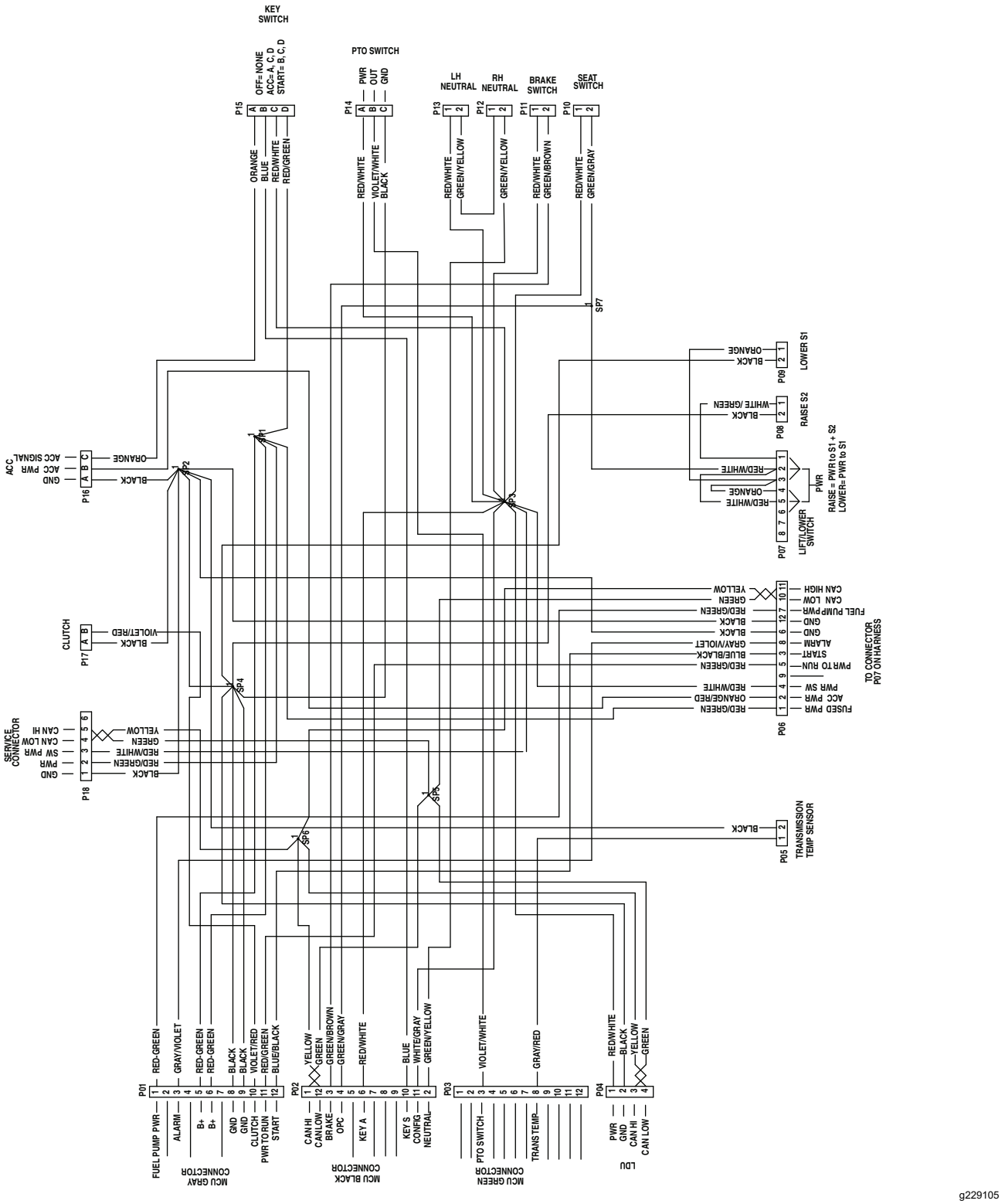
    Important: **Do not store stabilizer/conditioned fuel longer than the duration recommended by the fuel-stabilizer manufacturer.**
12. Check and tighten all bolts, nuts, and screws. Repair or replace any part that is damaged.
13. Paint all scratched or bare metal surfaces. Paint is available from your Authorized Service Dealer.
14. Store the machine in a clean, dry garage or storage area. Remove the key from the ignition 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 starter does not crank.	1. The blade-control switch (PTO) is engaged. 2. The parking brake is not engaged. 3. The drive levers are not in the NEUTRAL-LOCK position. 4. The operator is not seated. 5. The battery is dead. 6. The electrical connections are corroded or loose. 7. The fuse is blown. 8. The relay or switch is broken.	1. Move the blade-control switch (PTO) to disengaged. 2. Engage the parking brake. 3. Ensure that the drive levers are in the NEUTRAL-LOCK position. 4. Sit on the seat. 5. Charge the battery. 6. Check the electrical connections for good contact. 7. Replace the fuse. 8. Contact an Authorized Service Dealer.
The engine does not start, starts hard, or fails to keep running	1. The fuel tank is empty. 2. The oil level in the crankcase is low. 3. The throttle is not in the correct position. 4. There is dirt in fuel filter. 5. There is dirt, water, or stale fuel is in the fuel system. 6. The air cleaner is dirty. 7. The seat switch is not functioning properly. 8. The electrical connections are corroded, loose or faulty. 9. The relay or switch is broken.	1. Fill the fuel tank. 2. Add oil to the crankcase. 3. Be sure that the throttle control is midway between the SLOW and FAST positions. 4. Replace the fuel filter. 5. Contact an Authorized Service Dealer. 6. Clean or replace the air-cleaner element. 7. Check the seat switch indicator. Replace the seat if needed. 8. Check the electrical connections for good contact. Clean the connector terminals thoroughly with electrical contact cleaner, apply dielectric grease, and connect. 9. Contact an Authorized Service Dealer.
The engine loses power.	1. The engine load is excessive. 2. The air cleaner is dirty. 3. The oil level in the crankcase is low. 4. The cooling fins and air passages above the engine are plugged. 5. The vent hole in the fuel cap is plugged. 6. There is dirt in the fuel filter. 7. There is dirt, water, or stale fuel is in the fuel system.	1. Reduce the ground speed. 2. Clean the air-cleaner element. 3. Add oil to the crankcase. 4. Remove the obstruction from the cooling fins and air passages. 5. Clean or replace the fuel cap. 6. Replace the fuel filter. 7. Contact an Authorized Service Dealer.
The engine overheats.	1. The engine load is excessive. 2. The oil level in the crankcase is low. 3. The cooling fins and air passages above the engine are plugged.	1. Reduce the ground speed. 2. Add oil to the crankcase. 3. Remove the obstruction from the cooling fins and air passages.
The machine does not drive.	1. The by pass valves are not closed tight. 2. The pump belt is worn, loose or broken. 3. The pump belt is off a pulley. 4. The idler spring is broken or missing. 5. The hydraulic-fluid level is low or too hot.	1. Tighten the by pass valves. 2. Change the belt. 3. Change the belt. 4. Replace the spring. 5. Add hydraulic fluid to reservoirs or let it cool down.

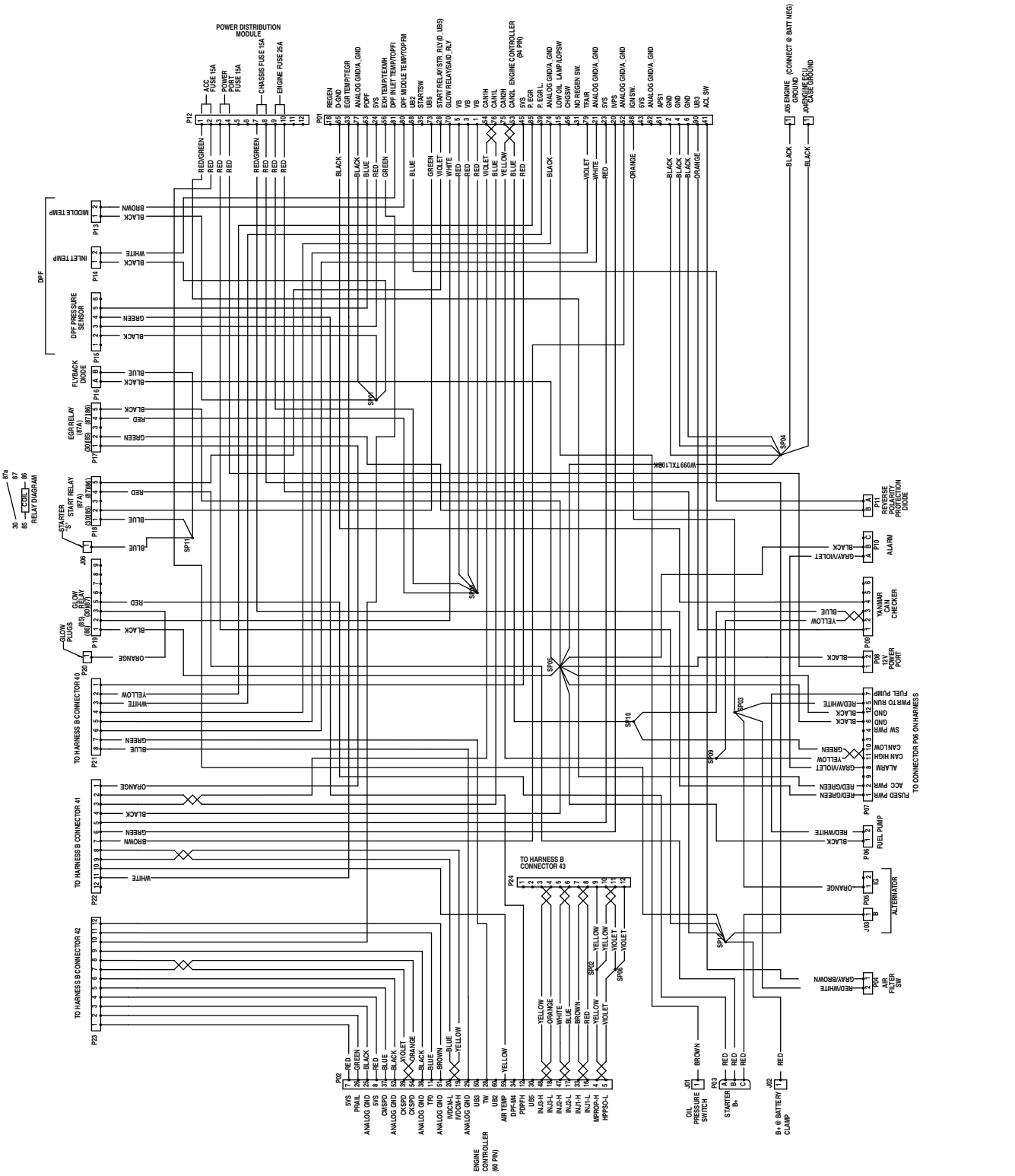
Problem	Possible Cause	Corrective Action
There is abnormal vibration.	1. The cutting blade(s) is/are bent or unbalanced.	1. Install new cutting blade(s).
	2. The blade mounting bolt is loose.	2. Tighten the blade mounting bolt.
	3. The engine mounting bolts are loose.	3. Tighten the engine mounting bolts.
	4. The engine pulley, idler pulley, or blade pulley is loose.	4. Tighten the appropriate pulley.
	5. The engine pulley is damaged.	5. Contact an Authorized Service Dealer.
	6. The blade spindle is bent.	6. Contact an Authorized Service Dealer.
	7. The motor mount is loose or worn.	7. Contact an Authorized Service Dealer.
Mowing is resulting in uneven cutting height.	1. The blade(s) is/are not sharp.	1. Sharpen the blade(s).
	2. The cutting blade(s) is/are bent.	2. Install new cutting blade(s).
	3. The mower deck is not level.	3. Level the mower deck from side-to-side and front-to-rear.
	4. The underside of mower is dirty.	4. Clean the underside of the mower.
	5. The tire pressure is not correct.	5. Adjust the tire pressure.
	6. The blade spindle bent.	6. Contact an Authorized Service Dealer.
The blades do not rotate.	1. The mower deck belt is worn, loose or broken.	1. Install a new deck belt.
	2. The mower deck belt is off pulley.	2. Install the mower deck pulley and check the idler pulley, idler arm, and spring for correct position and function.
	3. The pump drive belt is worn, loose or broken.	3. Check the belt tension or install a new belt.
	4. The idler spring is broken or missing.	4. Replace the spring.

Schematics



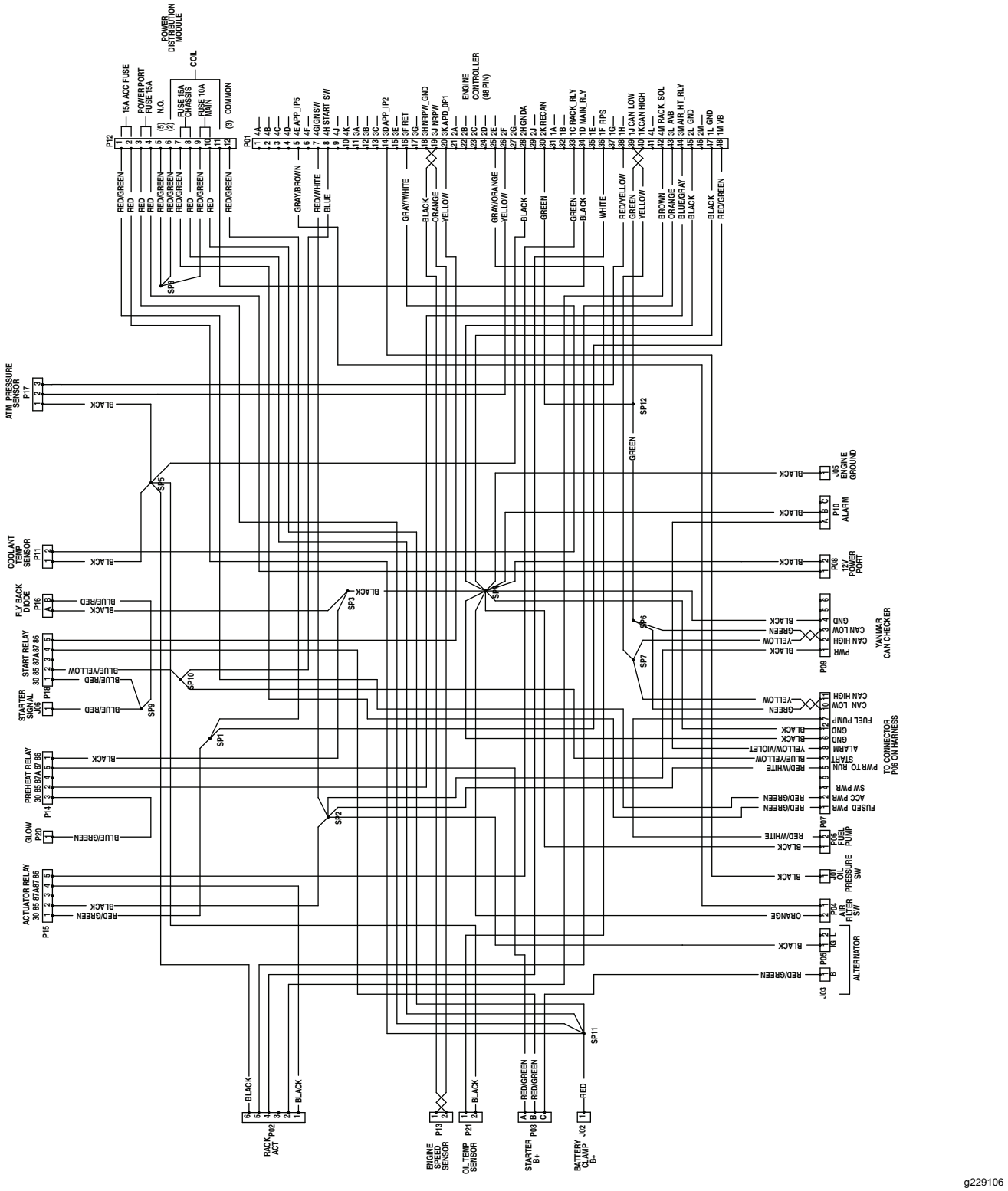
g229105

Electrical Schematic—Machine with Horizon Display Monitor (Rev. A)



g229107

Electrical Schematic—Yanmar Engine 3TNV80FT (Rev. A)



g229106

Electrical Schematic—Yanmar Engine 3TNV88C (Rev. A)

Notes:

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.

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.