Form No. 3421-127 Rev C

TORO®

Count on it.

Operator's Manual

48in, 52in, or 60in TITAN® HD 1500, 2000, or 2500 Series Riding Mower

Model No. 74450—Serial No. 402100000 and Up
Model No. 74451—Serial No. 402100000 and Up
Model No. 74452—Serial No. 402100000 and Up
Model No. 74463—Serial No. 402100000 and Up
Model No. 74465—Serial No. 400000000 and Up
Model No. 74466—Serial No. 400000000 and Up
Model No. 74467—Serial No. 400000000 and Up
Model No. 74470—Serial No. 402100000 and Up
Model No. 74471—Serial No. 402100000 and Up
Model No. 74472—Serial No. 402100000 and Up
Model No. 78450—Serial No. 402100000 and Up
Model No. 78472—Serial No. 400000000 and Up

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

3421-127

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

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

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

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

If you are unsure whether or not your machine has been converted for high-altitude use, look for the following label (Figure 4).



decal127-9363

Figure 4

⚠ WARNING

CALIFORNIA
Proposition 65 Warning

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

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

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

Introduction

This rotary-blade, riding lawn mower is intended to be used by professional, hired operators. It is designed primarily for cutting grass on well-maintained lawns on residential or commercial properties. 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.

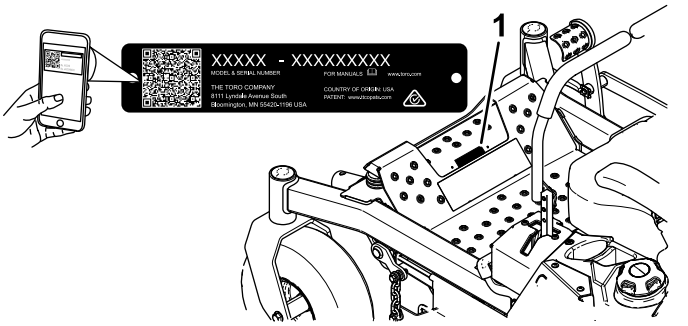
You may contact Toro directly at www.Toro.com for product safety and operation training materials, accessory information, help finding a dealer, or to register your product.

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 or Figure 2 identifies the location of the model and serial numbers on the product. Write the numbers in the space provided.

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

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Bloomington, MN 55420

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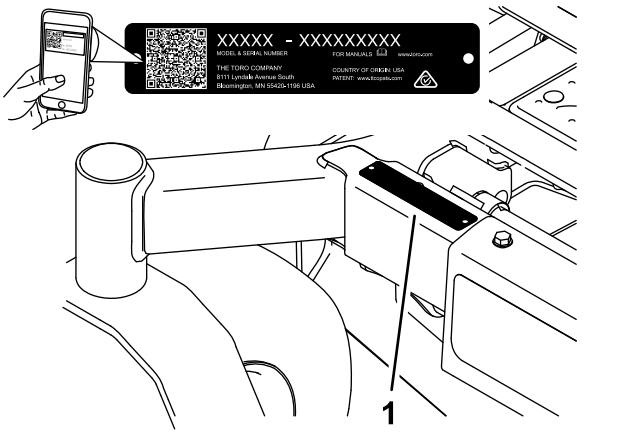


g233854

Figure 1

Machines without MyRide

1. Model and serial number location



g233855

Figure 2

Machines with MyRide

Model No. _____

Serial No. _____

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



g000502

Figure 3

Safety-alert symbol

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

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Safety

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.
- 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.

Slope Indicator

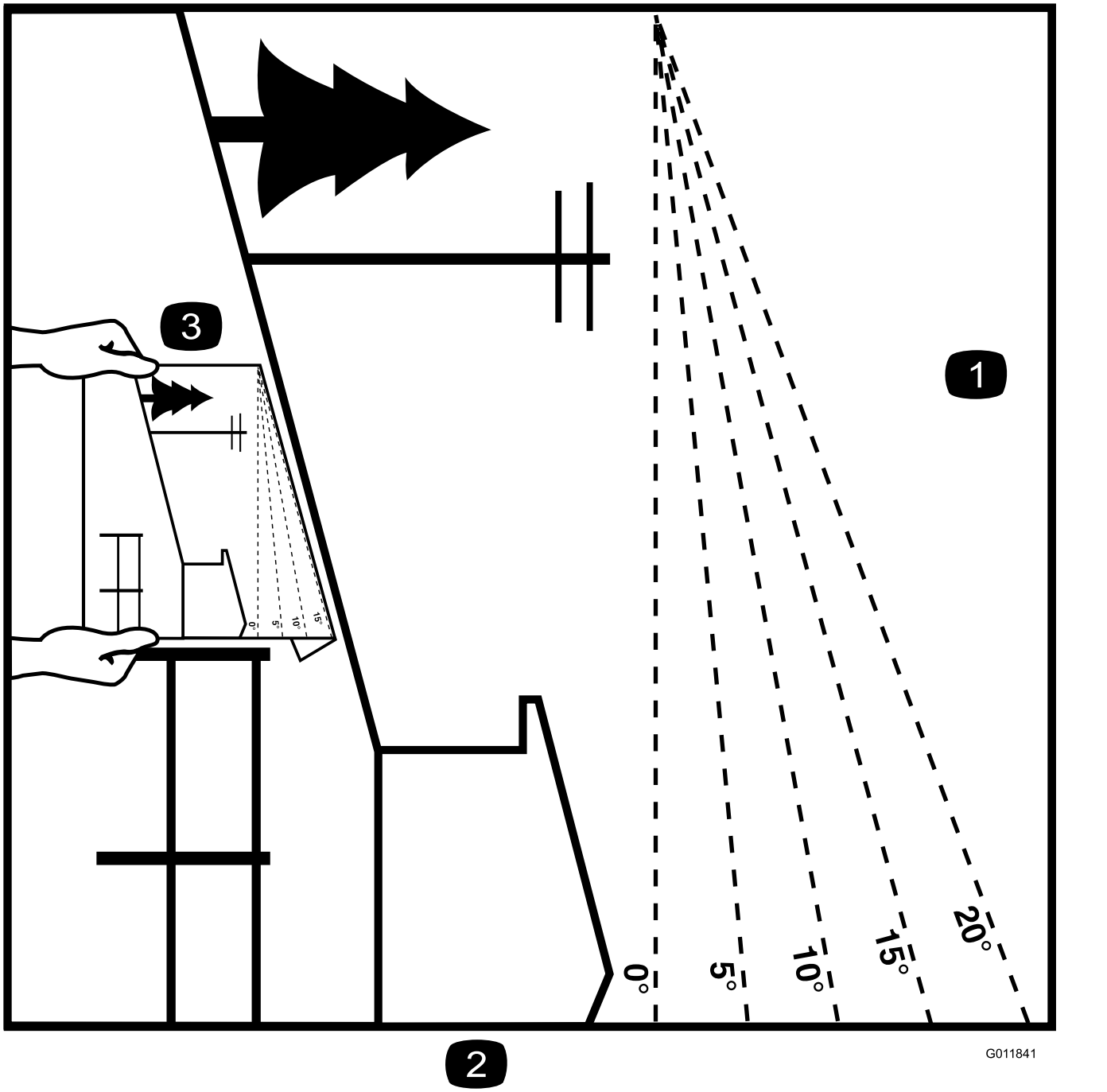


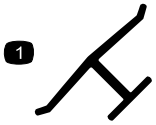
Figure 5

You may copy this page for personal use.

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

Safety and Instructional Decals

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



decaloemmarkt

Manufacturer's Mark

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

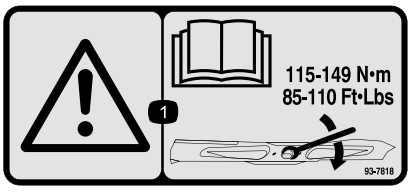


decalbatterysymbols

Battery Symbols

Some or all of these symbols are on your battery.

1. Explosion hazard
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



decal93-7818

93-7818

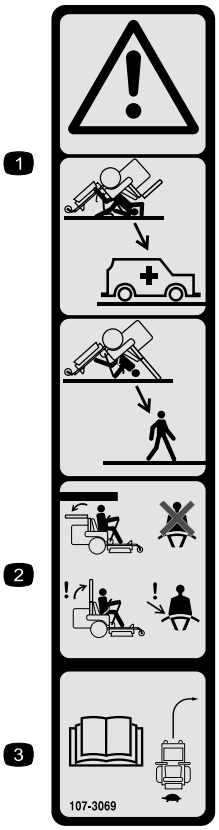
1. Warning—read the *Operator's Manual* for instructions on torquing the blade bolt/nut to 115-149 N·m (85-110 ft-lb).



decal106-5517

106-5517

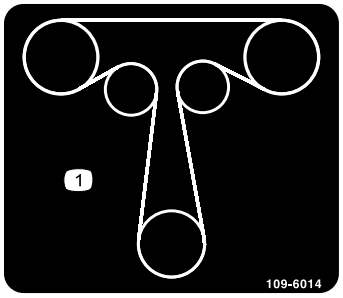
1. Warning—do not touch the hot surface.



decal107-3069

107-3069

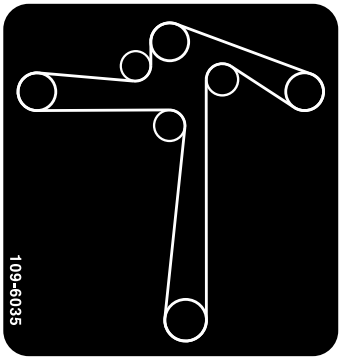
1. Warning—there is no rollover protection when the roll bar is down.
2. To avoid injury or death from a rollover accident, keep the roll bar in the fully raised and locked position and wear the seat belt. Lower the roll bar only when absolutely necessary; do not wear the seat belt when the roll bar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



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109-6014

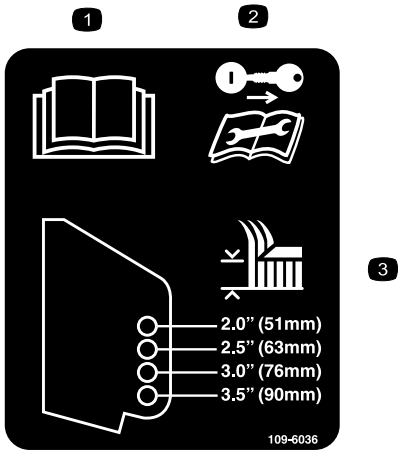
1. Traction belt routing



decal109-6035

109-6035

2500 Series Side Discharge Machines Only

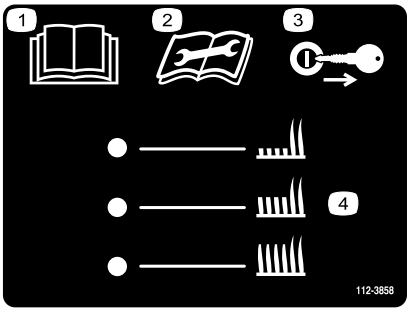


decal109-6036

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

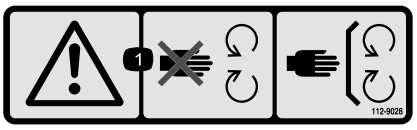


decal112-3858

112-3858

1500 and 2000 Series Side Discharge Machines Only

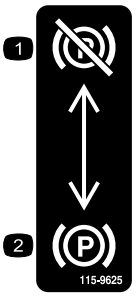
1. Read the *Operator's Manual*.
2. Read the instructions before servicing or performing maintenance.
3. Remove the key before adjusting the height of cut.
4. Height-of-cut settings.



decal112-9028

112-9028

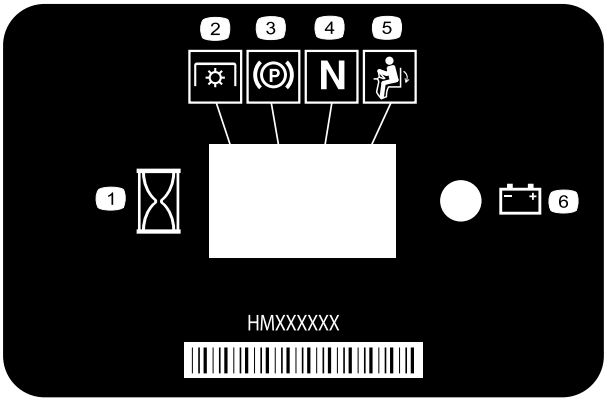
1. Warning—stay away from moving parts; keep all guards and shields in place.



decal115-9625

115-9625

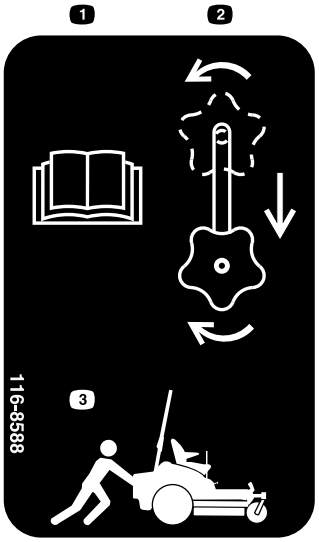
1. Parking brake—disengaged
2. Parking brake—engaged



decal116-5610

116-5610

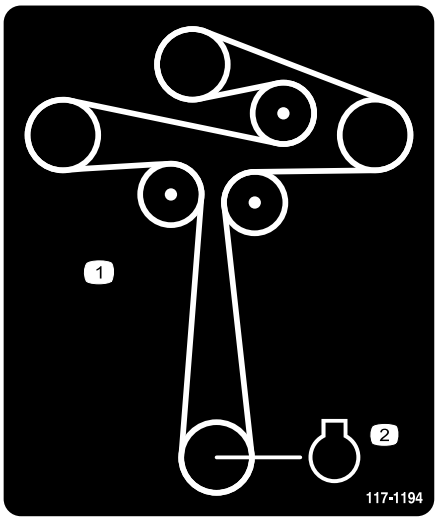
1. Hour meter
2. Power takeoff (PTO)
3. Parking brake
4. Neutral
5. Operator-presence switch
6. Battery



decal116-8588

116-8588

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



decal117-1194

117-1194

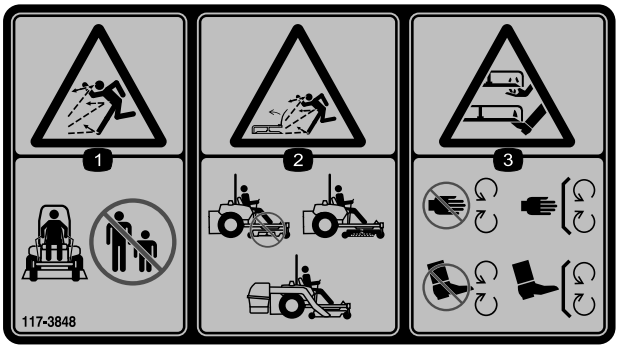
1500 and 2000 Series Side-Discharge Machines Only

1. Engine



decal117-2718

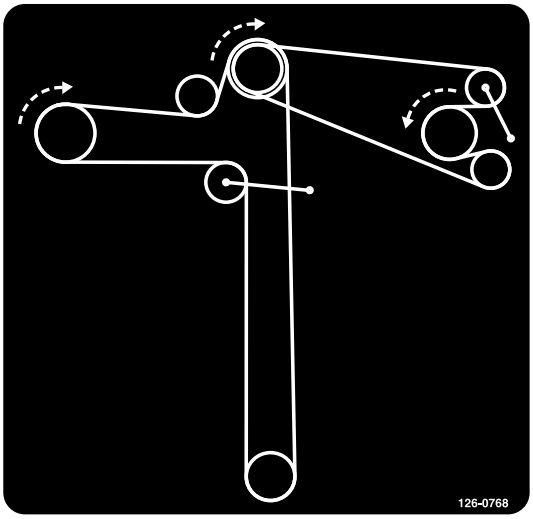
117-2718



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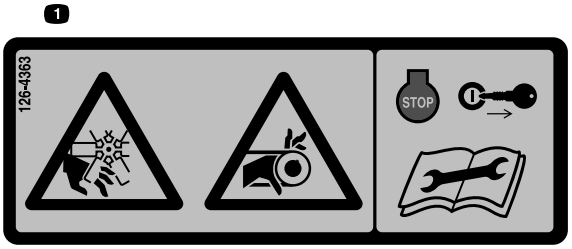
117-3848

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



decal126-0768

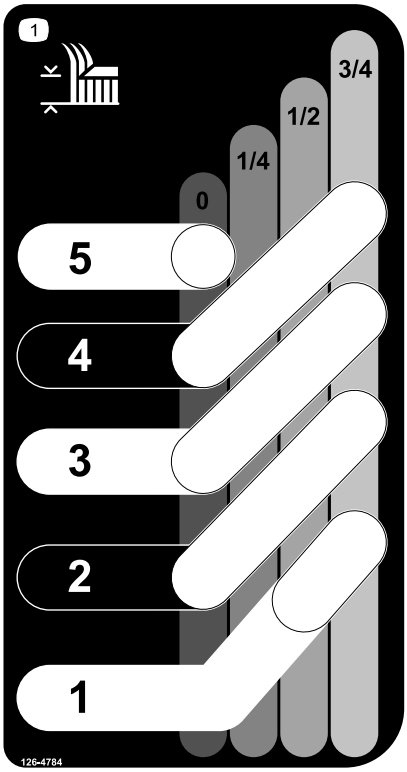
126-0768



decal126-4363

126-4363

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



decal126-4784

126-4784

1. Height of cut

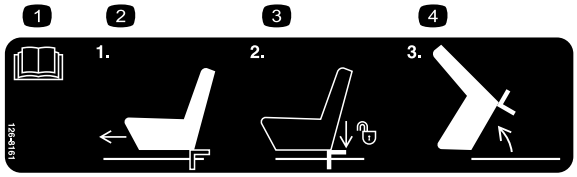


decal126-6599

126-6599

Rear Discharge Machines Only

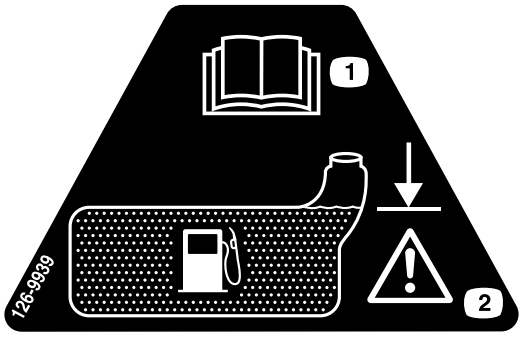
1. Thrown objects hazard—keep bystanders away.
2. Cutting/dismemberment of hand—stay away from moving parts; keep all guards and shields in place.



decal126-8161

126-8161

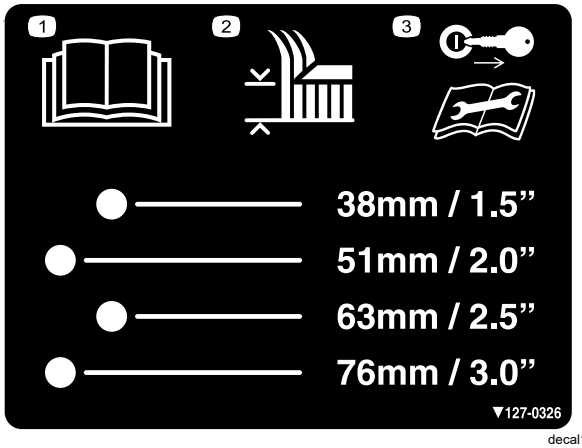
1. Read the *Operator's Manual.*
2. Slide seat forward
3. Press down on latch to unlock seat
4. Rotate seat



decal126-9939

126-9939

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

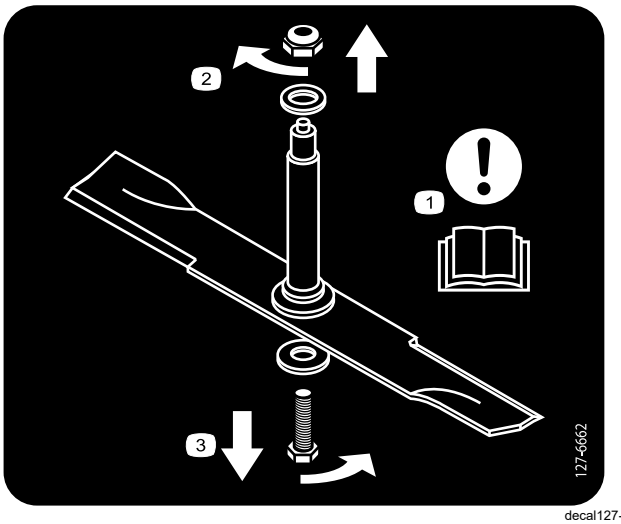


decal127-0326

127-0326

2500 Series Side Discharge Machines Only

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.

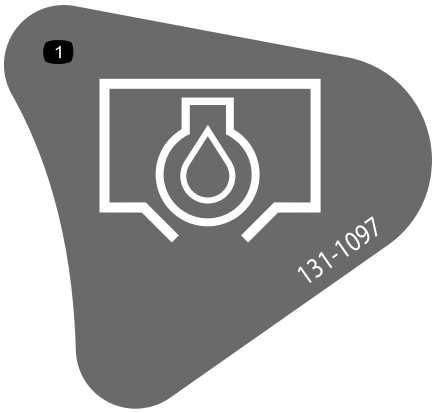


decal127-6662

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.

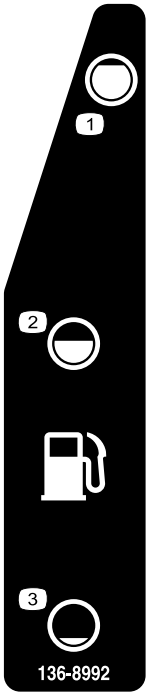


decal131-1097

131-1097

Toro Engines Only

1. Oil drain

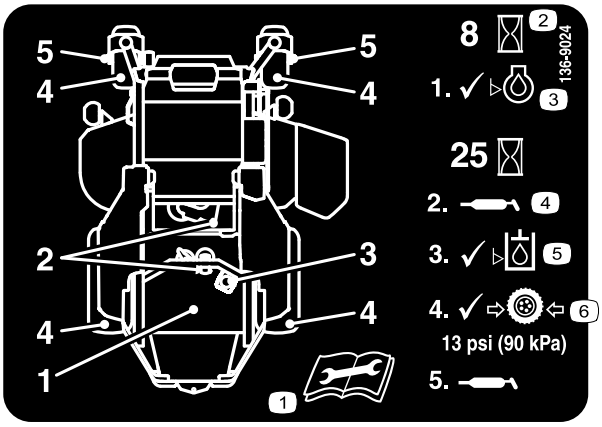


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136-8992

Machines with MyRide Only

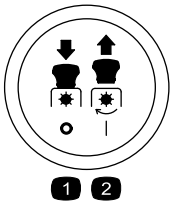
1. Fuel—full
2. Fuel—50%
3. Fuel—empty



decal136-9024

136-9024

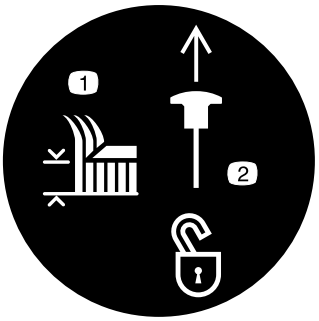
1. Read the *Operator's Manual* before performing maintenance.
2. Operating hours
3. Engine-oil level
4. Grease point
5. Hydraulic-fluid level
6. Tire pressure



decalptosymbols

PTO Switch Symbols

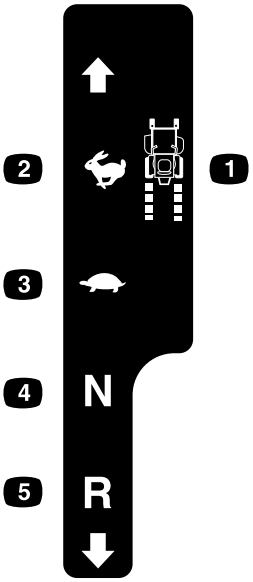
1. PTO–disengage
2. PTO–engage



decaltransportlock

Transport Lock

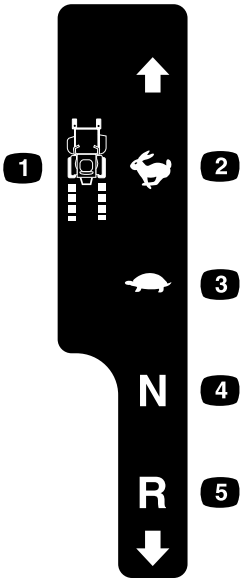
1. Height of cut
2. Pull up to unlock the transport lock.



decalmotioncntrllh-126-6194

Left Motion Control

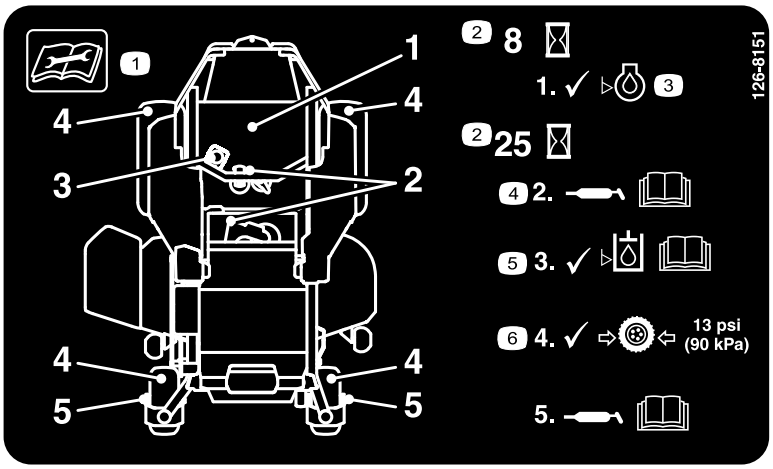
1. Machine speed
2. Fast
3. Slow
4. Neutral
5. Reverse



decalmotioncntrlrh-126-6183

Right Motion Control

1. Machine speed
2. Fast
3. Slow
4. Neutral
5. Reverse



decal126-8151

126-8151

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

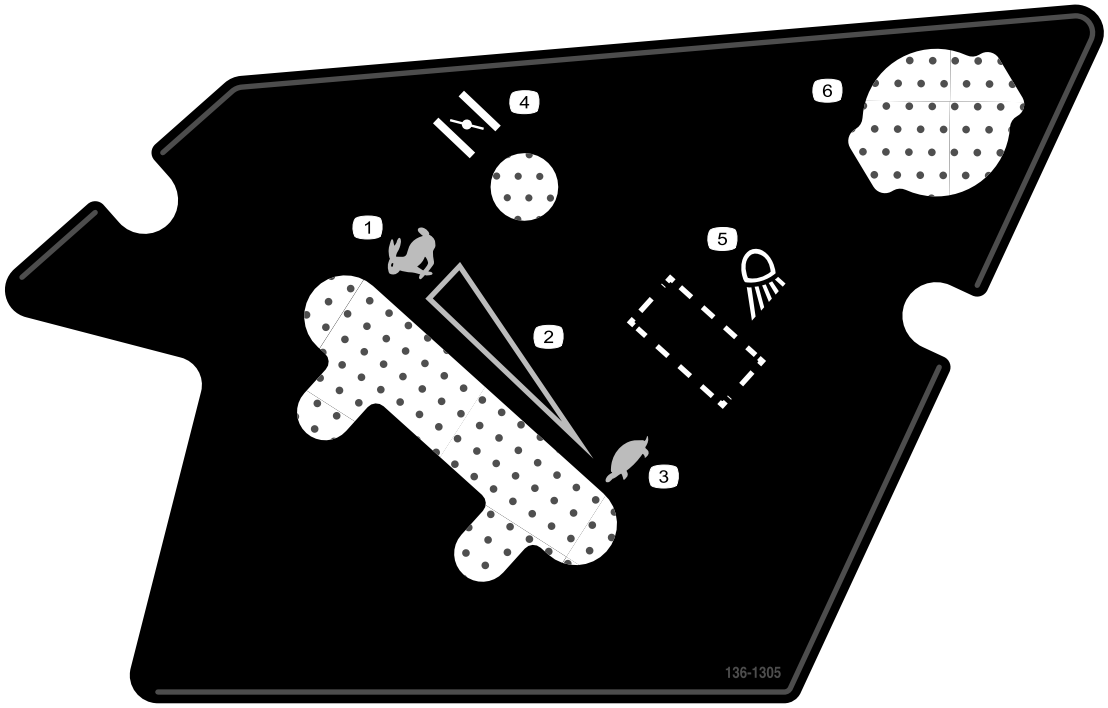


decal126-8383

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.

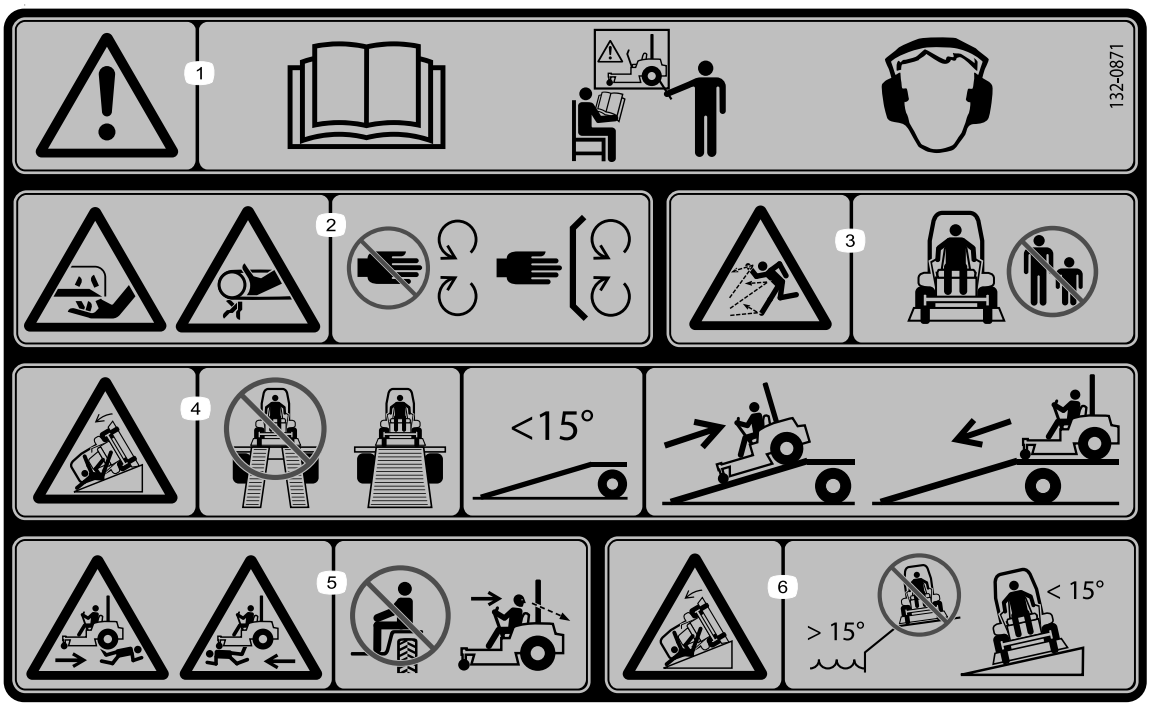
1. Warning—read the *Operator's Manual*; do not operate this machine unless you are trained; wear hearing protection.
2. Cutting/dismemberment hazard of the hand, mower blade; entanglement hazard of the hand, belt—stay away from moving parts; keep all guards and shields in place.
3. Ramp hazard—do not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



decal136-1305

136-1305

1. Fast
2. Continuous-variable setting
3. Slow
4. Choke
5. Work light (optional)
6. Power point



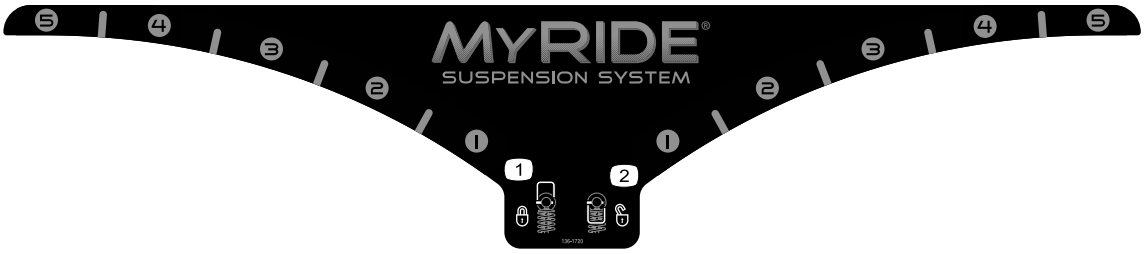
decal132-0871

132-0871

Machines with MyRide Only

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 those conditions on that day and at that site. Changes in the terrain can result in a change in slope operation for the machine. If possible, keep the cutting units lowered to the ground while operating the machine on slopes. Raising the cutting units while operating on slopes can cause the machine to become unstable.

1. Warning—read the *Operator's Manual*; do not operate this machine unless you are trained; wear hearing protection.
2. Cutting, dismembering, and entanglement hazard—keep hands away from moving parts; keep all guards and shields in place.
3. Thrown object hazard—keep bystanders away.
4. Ramp hazard—when loading onto a trailer, do not use dual ramps; only use a singular ramp wide enough for the machine and that has an incline less than 15°; back up the ramp (in reverse) and drive forward off the ramp.
5. Bodily harm hazard—do not carry passengers; look behind you when mowing in reverse.
6. Tipping hazard on slopes—do not use on slopes near open water; do not use on slopes greater than 15°.



decal136-1720

136-1720

1. Cam lock
2. Cam unlock

Product Overview

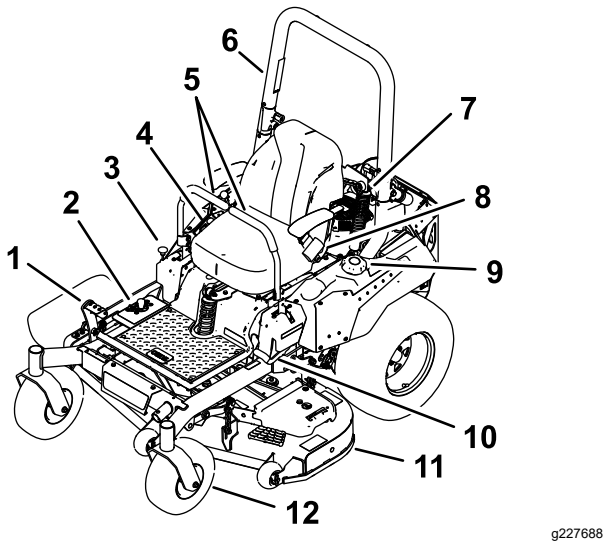


Figure 6

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

Controls

Become familiar with all the controls before you start the engine and operate the machine (Figure 6 and Figure 7).

Control Panel

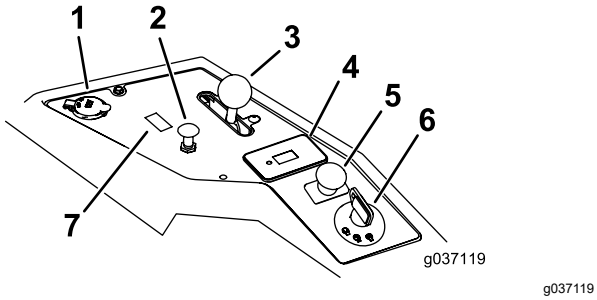


Figure 7

1. Power port
2. Choke control
3. Throttle control
4. Hour meter
5. Blade-control switch (power takeoff)
6. Key switch
7. Switch position for optional light kit

Key Switch

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

Choke Control

Use the choke control to start a cold engine.

Throttle Control

The throttle controls the engine speed, and it has a continuous-variable setting from the SLOW to FAST position (Figure 7).

Blade-Control Switch (Power Takeoff)

The blade-control switch, represented by a power-takeoff (PTO) symbol, engages and disengages power to the mower blades (Figure 7).

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 8).

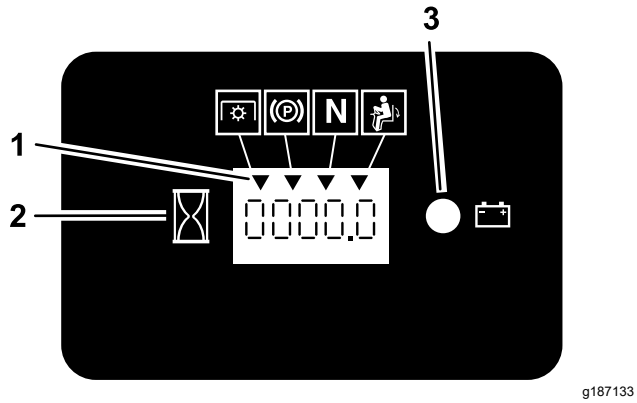
Safety-Interlock Indicators

There are symbols on the hour meter that indicate with a black triangle that the interlock component is positioned correctly (Figure 8).

Battery-Indicator Light

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

The battery light turns on when the ignition is turned on and when the charge is below the correct operating level (Figure 8).



g187133

Figure 8

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

Motion-Control Levers

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

Neutral-Lock Position

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

Fuel-Shutoff Valve

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

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

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

Width—Machines with Side Discharge Mower Decks

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

Width—Machines with Rear Discharge Mower Decks

	60-inch Deck
Without mower deck	133 cm (52 inches)
With mower deck	168 cm (66 inches)

Length—Machines with Side Discharge Mower Decks

	48-inch Deck	52-inch Deck	60-inch Deck
Length	208 cm (82 inches)	208 cm (82 inches)	209 cm (83 inches)

Length—Machines with Rear Discharge Mower Decks

	60-inch Deck
With mower deck	215 cm (84-1/2 inches)

Height

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

Weight

Machines	Weight
48-inch side-discharge machines	385 to 425 kg (849 to 937 lb)
52-inch side-discharge machines	391 to 434 kg (862 to 957 lb)
60-inch side-discharge machines	409 to 456 kg (901 to 1006 lb)
60-inch rear-discharge machines	459 kg (1,012 lb)

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

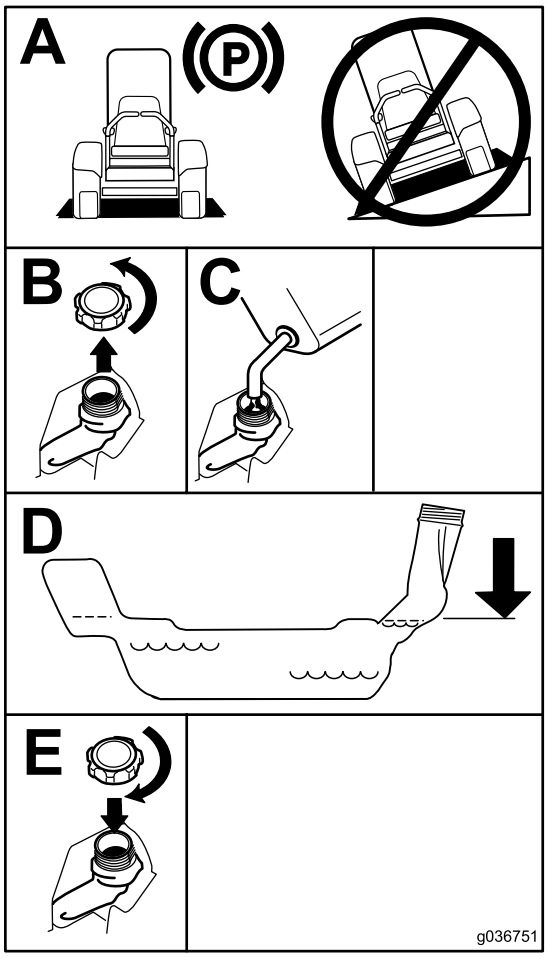
Recommended Fuel

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

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 until the fuel gauge reads at the full mark (Figure 9).

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



g036751

Figure 9

Adding Fuel

Recommended Fuel

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

Using Stabilizer/Conditioner

Use fuel stabilizer/conditioner in the machine at all times to keep the fuel fresh longer when used as directed by the fuel-stabilizer manufacturer.

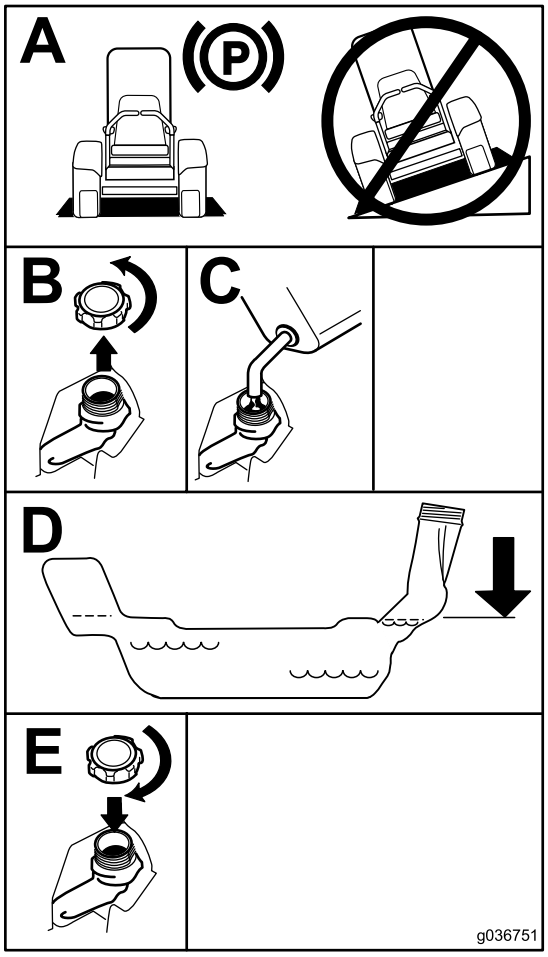
Important: **Do not use fuel additives containing methanol or ethanol.**

Add the amount of fuel stabilizer/conditioner to fresh fuel as directed by the fuel-stabilizer manufacturer.

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 until the fuel gauge reads at the full mark (Figure 9).

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



g036751

Figure 10

Performing Daily Maintenance

Before starting the machine each day, perform the Each Use/Daily procedures listed in Maintenance (page 38).

Breaking in a New Machine

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

Using the Rollover-Protection System (ROPS)

⚠ WARNING

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

Ensure that the seat is secured to the machine.

⚠ WARNING

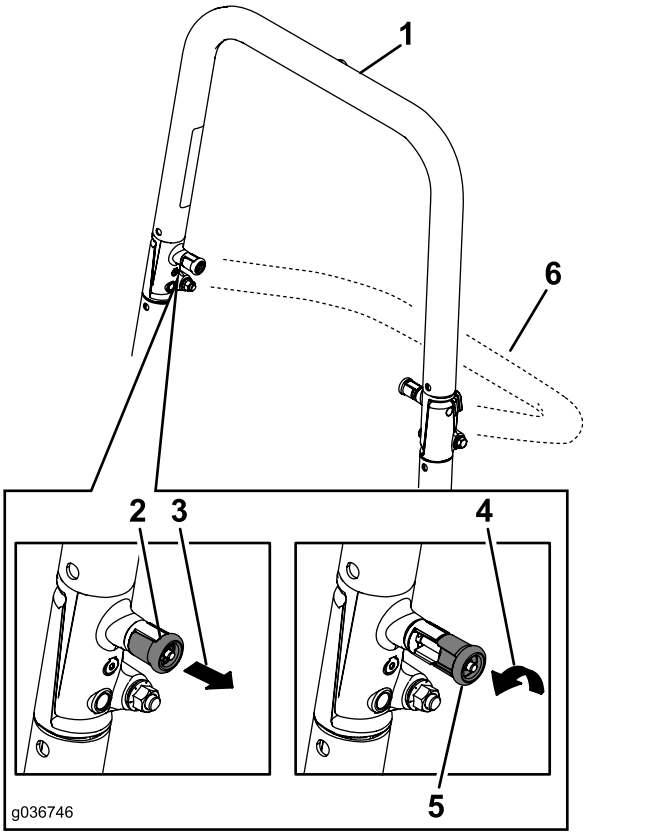
There is no rollover protection when the roll bar is in the down position.

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

Lowering the Roll Bar

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

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



g036746

Figure 11

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

Raising the Roll Bar

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

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

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.**

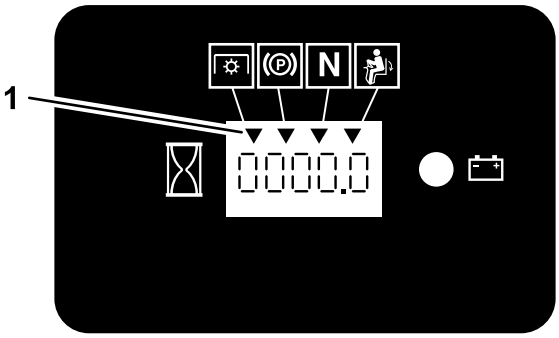
Understanding the Safety-Interlock System

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

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

The safety-interlock system is also designed to shut off the engine when the traction controls are moved from the locked position with the parking brake engaged or if you rise from the seat when the PTO is engaged.

The hour meter has symbols to notify the user when the interlock component is in the correct position. When the component is in the correct position, a triangle lights up in the corresponding square.



g187670

Figure 12

1. Triangles light up when the interlock components are in the correct position

Testing the Safety-Interlock System

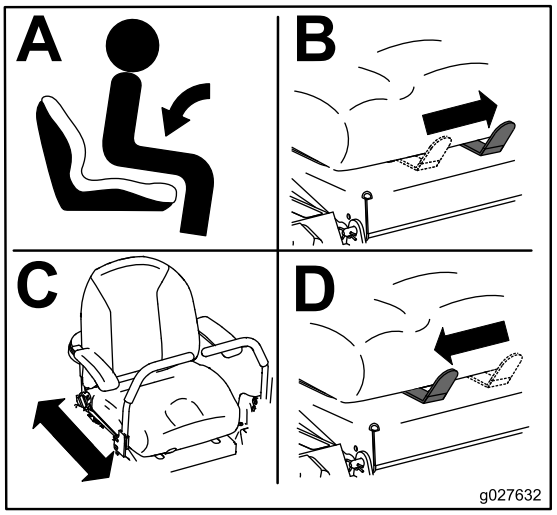
Service Interval: Before each use or daily

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 crank.
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 crank. Repeat for 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. 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 NEUTRAL-LOCK position. Start the engine. While the engine is running, center either motion-control lever and move it forward or reverse; the engine should shut off. Repeat for other motion-control lever.
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 NEUTRAL-LOCK position. Try starting the engine; the engine should not crank.

Positioning the Seat

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



g027632

Figure 13

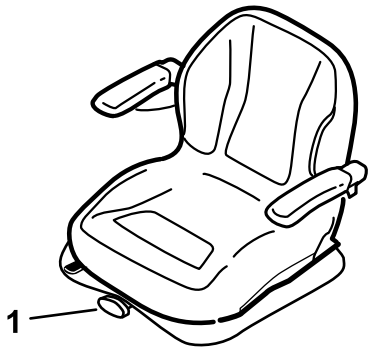
Seat for machines with MyRide shown.

Changing the Seat Suspension

Machines without MyRide™ Suspension System Only

The seat is adjustable to provide a smooth and comfortable ride. Position the seat where you are most comfortable.

To adjust it, turn the knob in front either direction to provide the best comfort (Figure 14).



g024881

Figure 14

1. Seat-suspension knob

Adjusting the MyRide™ Suspension System

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

Adjusting the Rear-Shock Assemblies

The slots for the rear-shock assemblies have detent positions for reference. You can position the rear-shock assemblies anywhere in the slot, not just in the detent positions.

The following graphic shows the position for a soft or firm ride and the different detent positions (Figure 15).

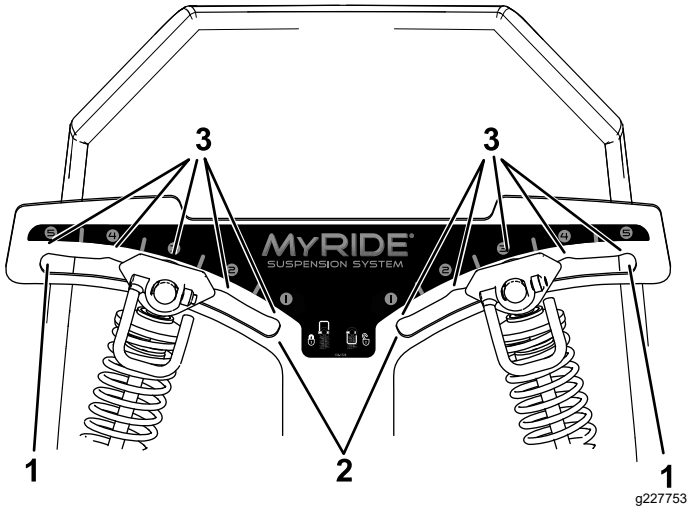
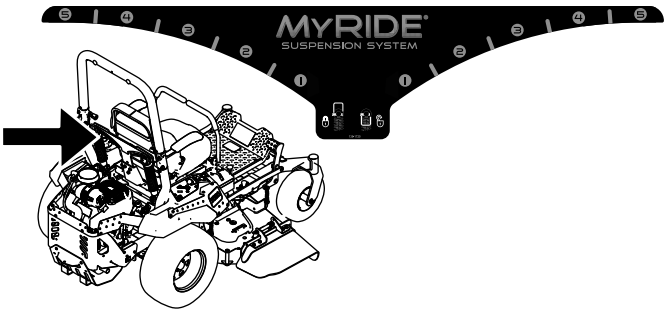


Figure 15

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

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

Adjust the rear-shock assemblies (Figure 16).



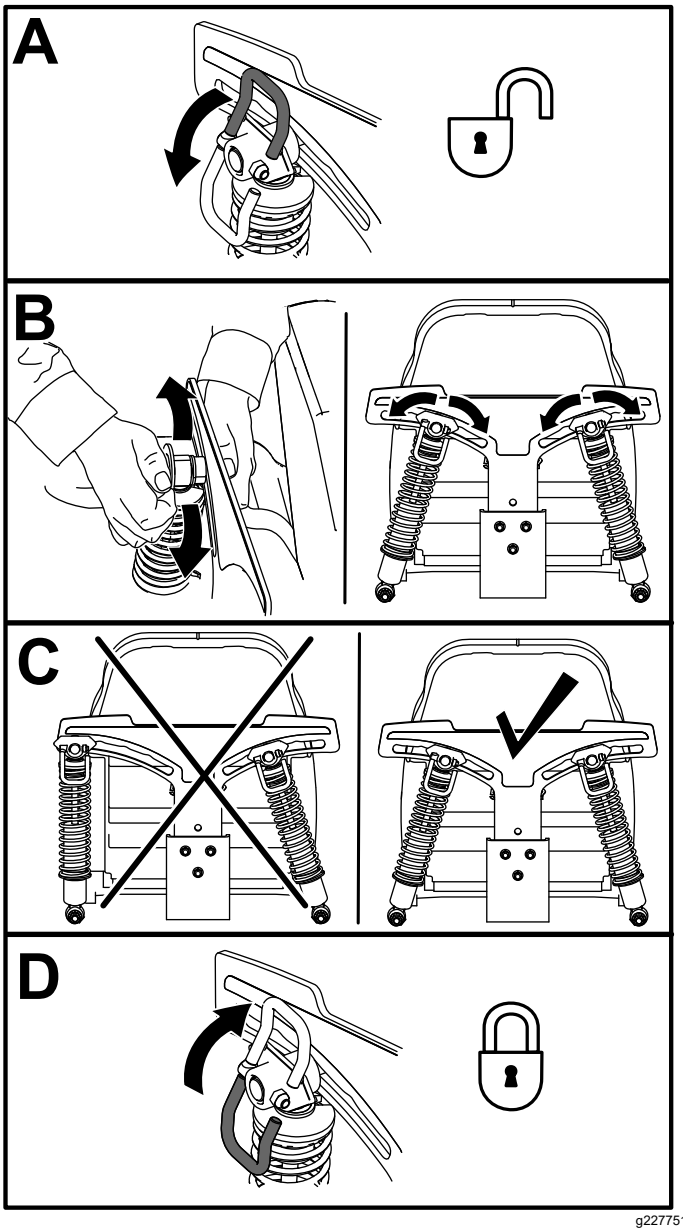
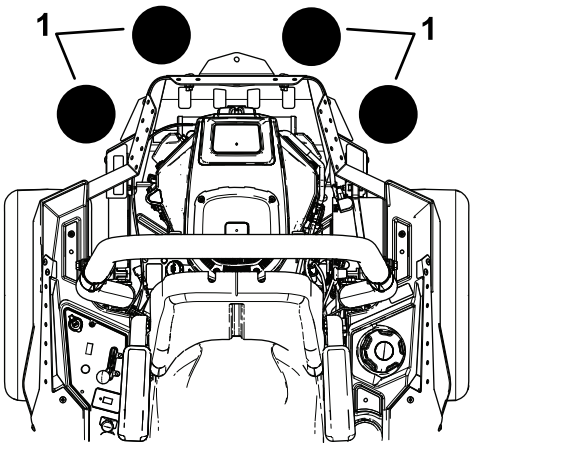


Figure 16

Using Attachments and Accessories

Use only Toro approved attachments and accessories.

If more than one accessory-mount kit (i.e., bucket kit or universal mount kit) is added to any of the 4 locations shown in Figure 17, add a front-weight kit. Contact your Authorized Service Dealer for the front-weight kit.



g037417

Figure 17

1. Add a front-weight kit when 2 or more accessory-mount kits are installed at these positions.

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.
- 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 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 18

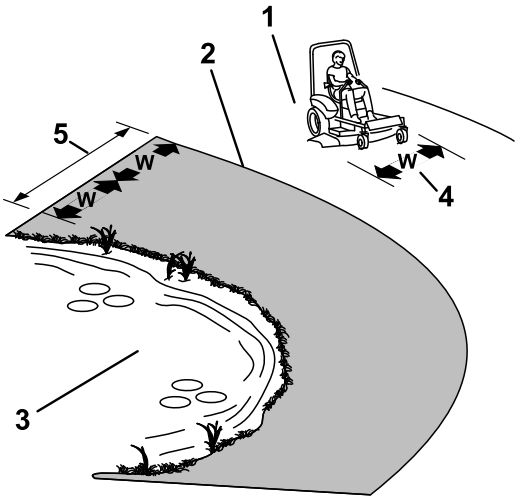
1. Wear hearing protection.

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.



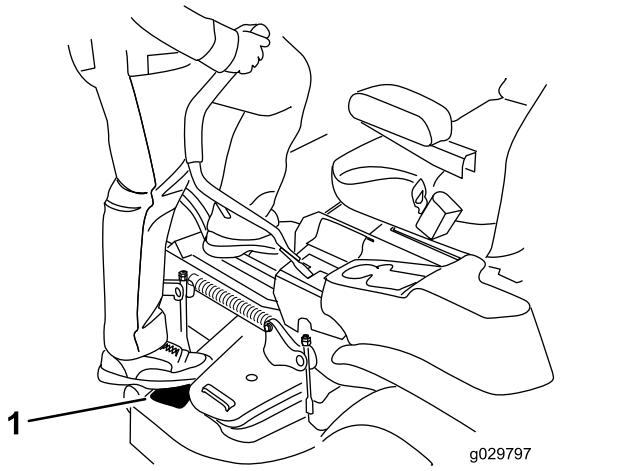
g221745

Figure 19

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.

Entering the Operator's Position

Use the mower deck as a step to get into the operator's position (Figure 20).



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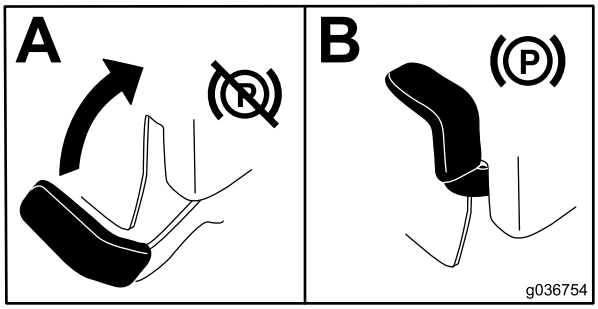
Figure 20

Operating the Parking Brake

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

Engaging the Parking Brake

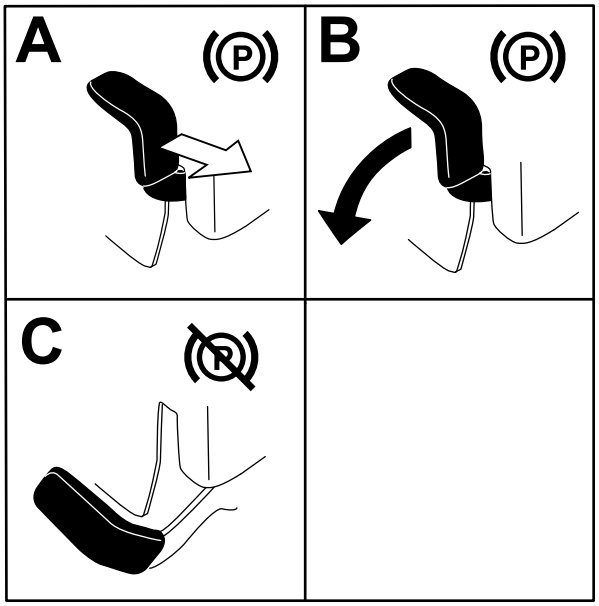
Park the machine on a level surface.



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Figure 21

Disengaging the Parking Brake



g192635

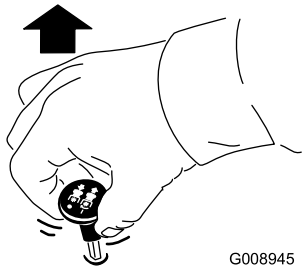
Figure 22

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)

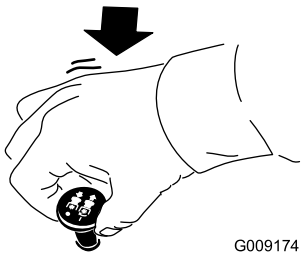
Note: Engaging the blade-control switch (PTO) with the throttle position at half or less causes excessive wear to the drive belts.



g008945

Figure 23

Disengaging the Blade-Control Switch (PTO)



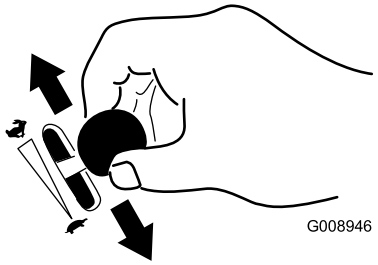
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Figure 24

Operating the Throttle

You can move the throttle control between FAST and SLOW positions (Figure 25).

Always use the FAST position when engaging the PTO.



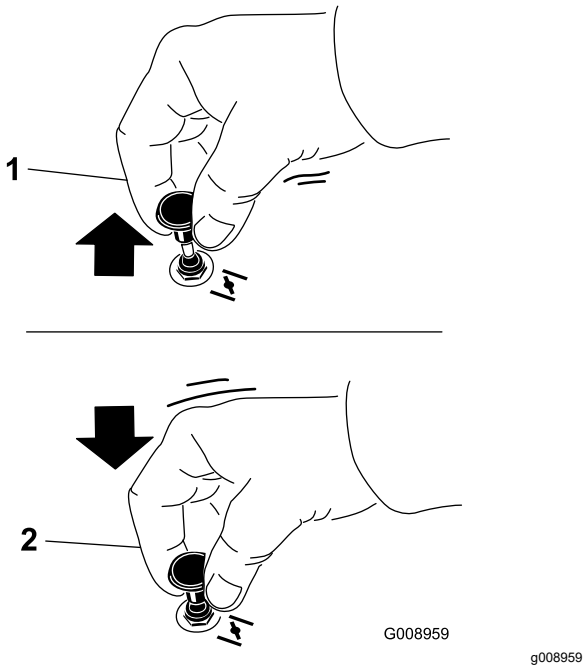
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Figure 25

Operating the Choke

Use the choke to start a cold engine.

1. Pull up the choke knob to engage the choke before using the key switch (Figure 26).
2. Push down the choke knob to disengage the choke after the engine has started (Figure 26).



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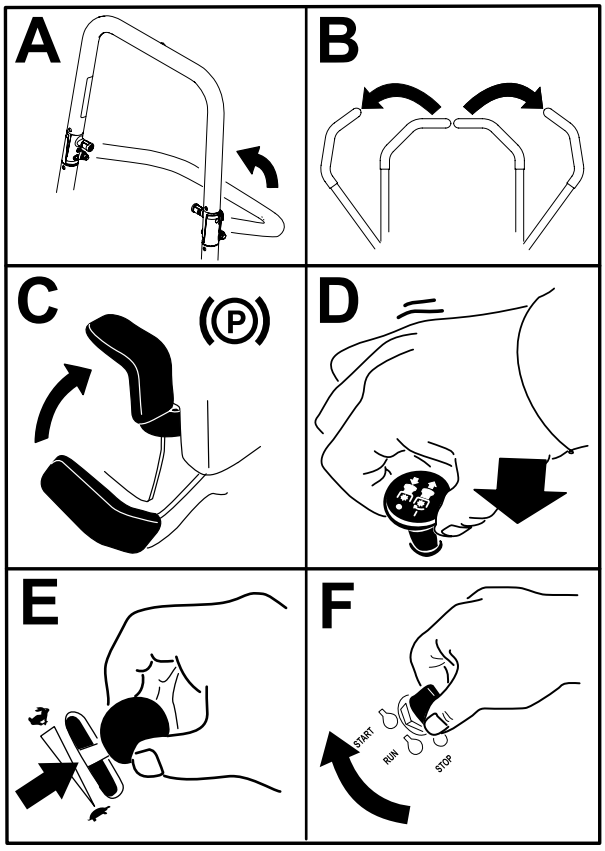
Figure 26

1. ON position
2. OFF position

Starting the Engine

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

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



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Figure 27

Shutting Off the Engine

Note: Refer to Figure 46 to determine which engine you have.

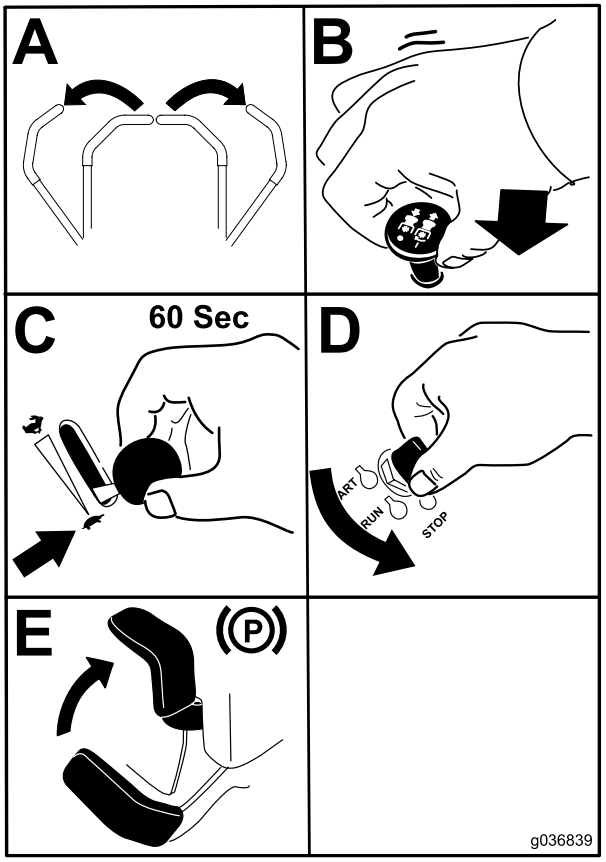
⚠ CAUTION

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

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

Shutting Off Kawasaki Engines

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



g036839

Figure 28

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

Shutting Off Kohler Engines

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

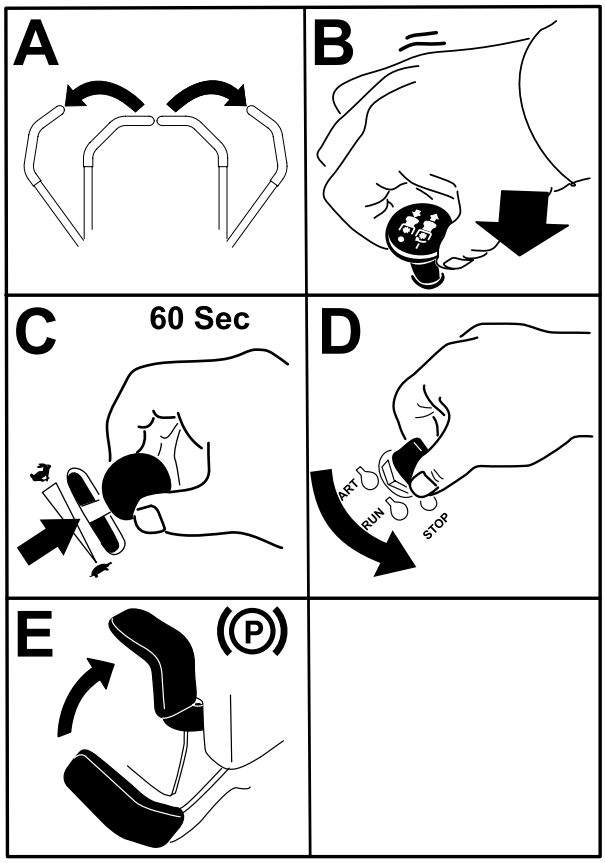


Figure 29

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

Shutting Off Toro Engines

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

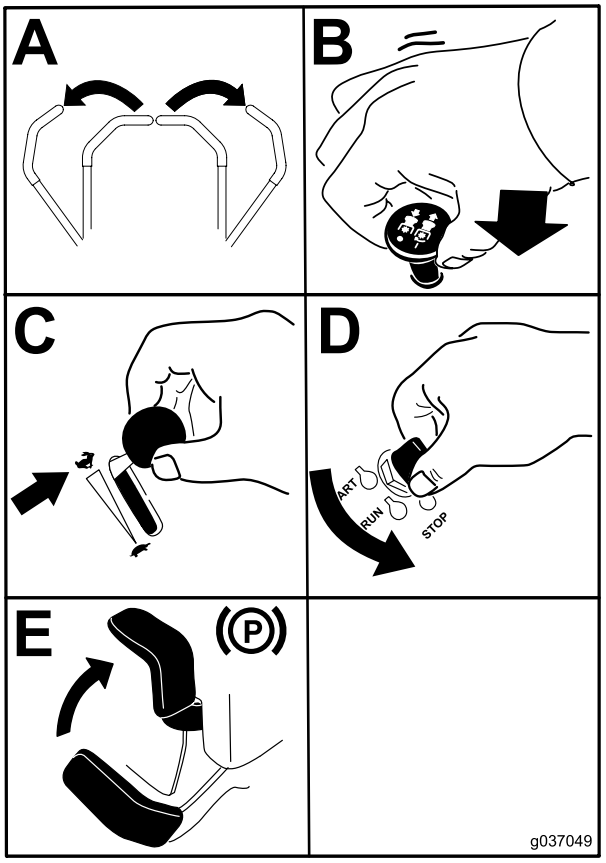


Figure 30

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

Using the Motion-Control Levers

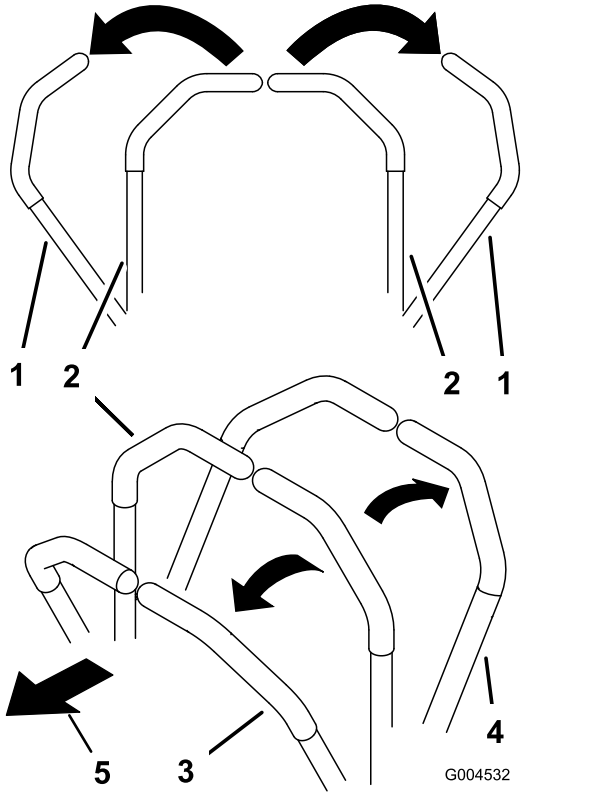


Figure 31

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

Driving the Machine

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

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

⚠ WARNING

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

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

Driving Forward

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

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

1. Disengage the parking brake; refer to Disengaging the Parking Brake (page 26).
2. Move the levers to the center, unlocked position.
3. To go forward, slowly push the motion-control levers forward (Figure 32).

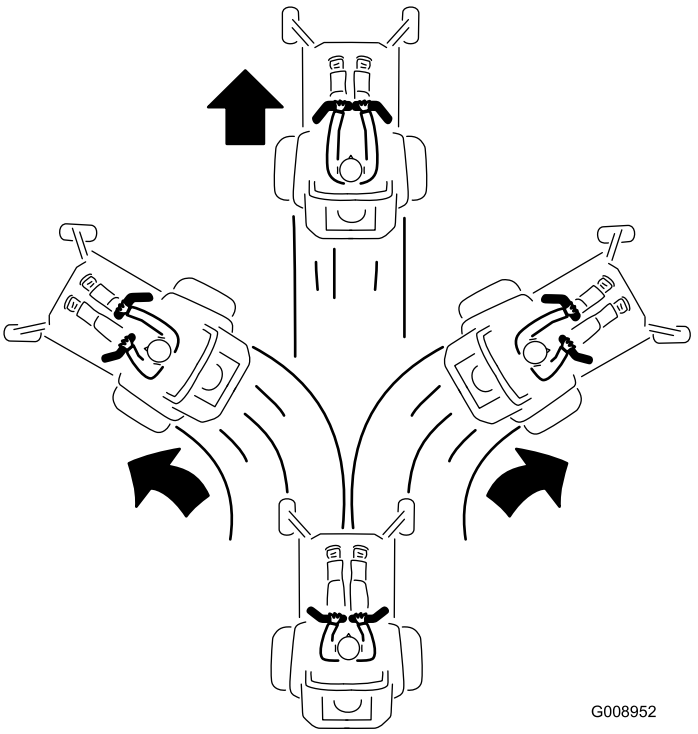
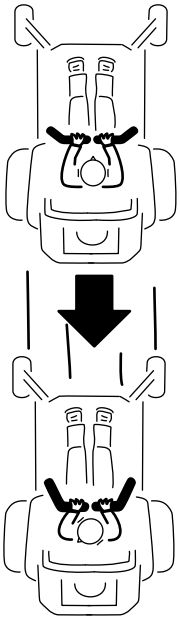


Figure 32

Driving Backward

1. Move the levers to the center, unlocked position.
2. To go backward, slowly pull the motion-control levers rearward (Figure 33).



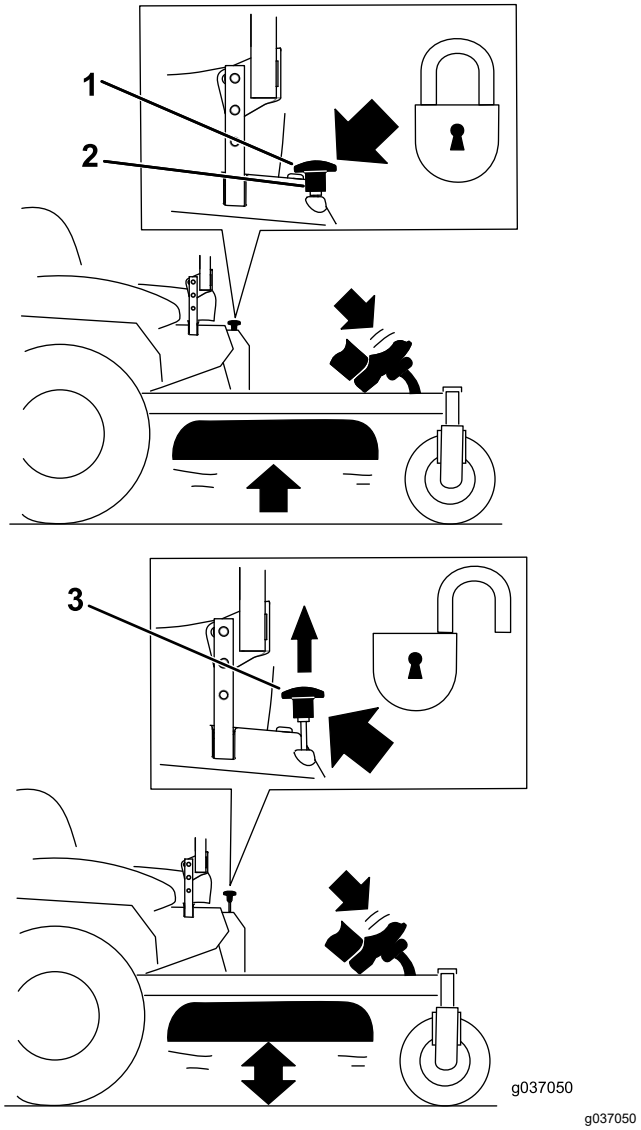
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Figure 33

Adjusting the Height of Cut

Using the Transport Lock

The transport lock has 2 positions, and is used with the deck-lift pedal. There is a LOCK position and an UNLOCK position for the transport position of the mower deck (Figure 34).



g037050

Figure 34

Transport-Lock Positions

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

Adjusting the Height-of-Cut Pin

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

1. Move the transport lock to the LOCK position.
2. Push on the deck-lift pedal with your foot and raise the mower deck to the TRANSPORT position (also the 127 mm or 5 inch cutting-height position) as shown in Figure 35.
3. Remove the pin from the height-of-cut bracket (Figure 35).
4. Select a hole in the height-of-cut bracket corresponding to the height-of-cut desired, and insert the pin (Figure 35).
5. Push on the deck lift, pull up on the transport lock knob, and slowly lower the mower deck.

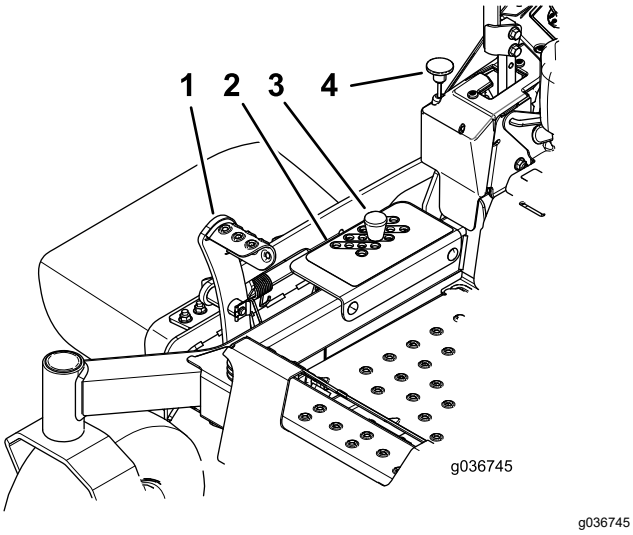


Figure 35

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

Adjusting the Anti-Scalp Rollers

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

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

1. Park the machine on a level surface, disengage the blade-control switch and engage the parking brake; refer to Engaging the Parking Brake (page 26).
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Adjust the anti-scalp rollers as shown in Figure 36 or Figure 37.

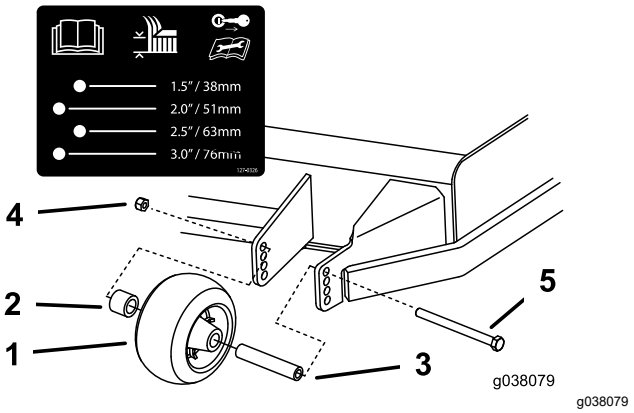


Figure 36

2500 Series mower deck shown

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

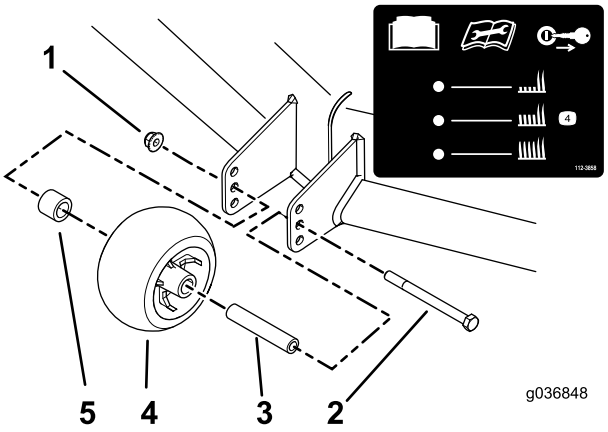


Figure 37

1500 and 2000 Series mower deck shown

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

Adjusting the Side Bumpers

Rear-Discharge Machines Only

Install the side bumpers in the top holes when operating in a height of cut higher than 64 mm (2-1/2 inches) and in the center holes when operating in a height of cut lower than 64 mm (2-1/2 inches).

Note: When the bumpers become worn, switch the bumpers to the opposite sides of the mower and flip them over. This allows you to use the bumpers longer before replacing them.

1. Park the machine on a level surface, disengage the blade-control switch and engage the parking brake; refer to Engaging the Parking Brake (page 26).
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Raise the mower to the transport position.
4. Remove the bolts and nuts from each bumper (Figure 38).

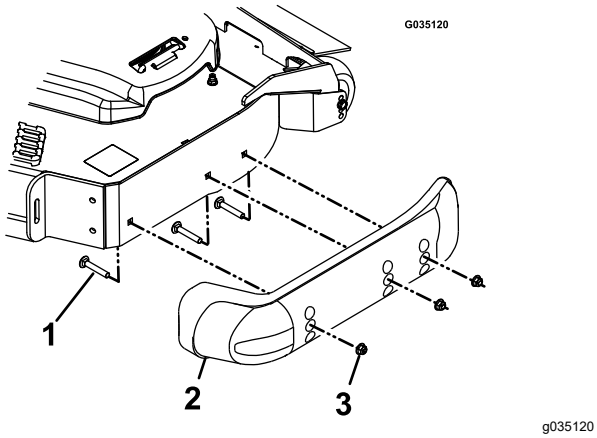


Figure 38

1. Bolt
2. Bumper
3. Nut

5. Move each bumper to the desired position and secure them with the bolts and nuts.

   Note: Use only the top or center sets of holes to adjust the bumpers. You use the bottom holes when switching sides, at which time they become the top holes on the other side of the mower.

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.**

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

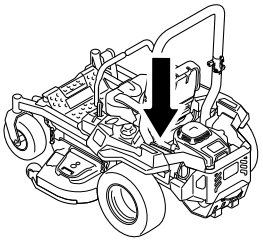
General Safety

- 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.

Using the Fuel-Shutoff Valve

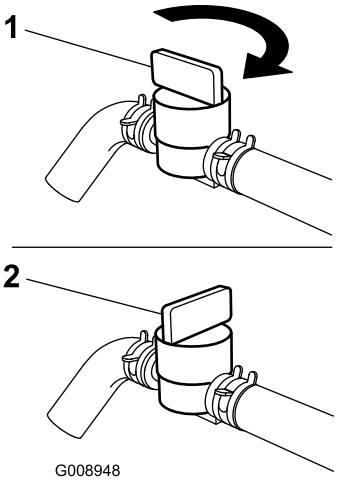
Close the fuel-shutoff valve for transport, maintenance, and storage (Figure 39).

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



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Figure 39

1. ON position
2. OFF position

Using the Drive-Wheel Release Valves

⚠ WARNING

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

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

⚠ WARNING

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

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

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

1. Park the machine on a level surface, disengage the blade-control switch, and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Locate the bypass levers behind the seat, down on the left and right side of the frame.
4. To push the machine, move both bypass knobs rearward and lock them into place (Figure 40).
5. Disengage the parking brake before pushing the machine.

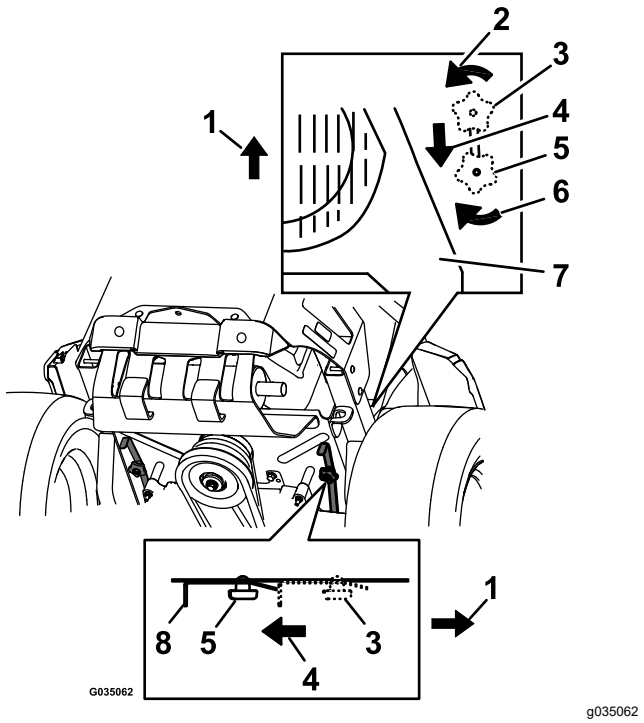


Figure 40

1. Front of the machine
2. Rotate bypass release knob counterclockwise to loosen.
3. Lever position for operating the machine
4. Pull the lever in this direction to push the machine.
5. Lever position for pushing the machine
6. Rotate the bypass-release knob clockwise to tighten.
7. Engine
8. Release lever

6. To run the machine, move the bypass knobs to the FORWARD position and lock them into place (Figure 40).

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 41).

- **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 ramp is at least 4 times as long as the height of the trailer or truck bed to the ground. This ensures that ramp angle does not exceed 15 degrees on flat ground.**

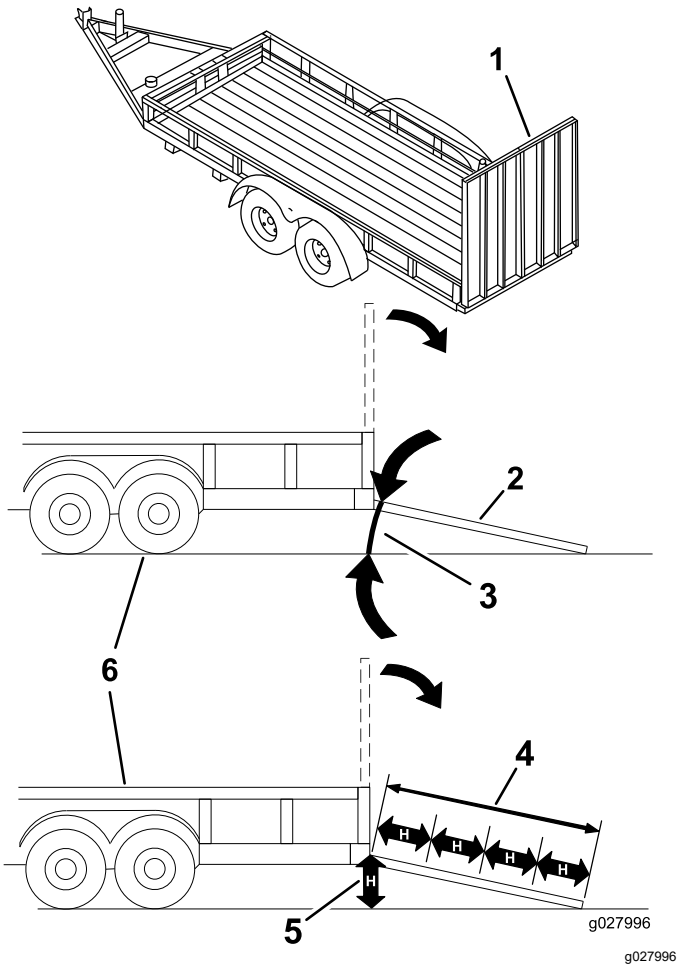


Figure 41

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 41).
4. Back the machine up the ramp (Figure 42).

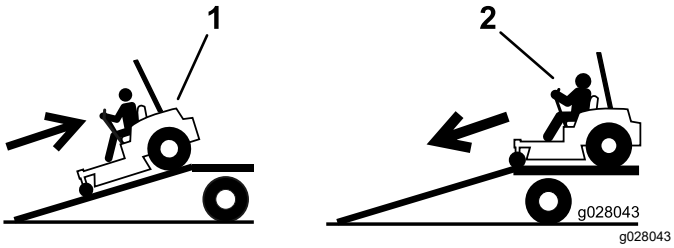


Figure 42

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

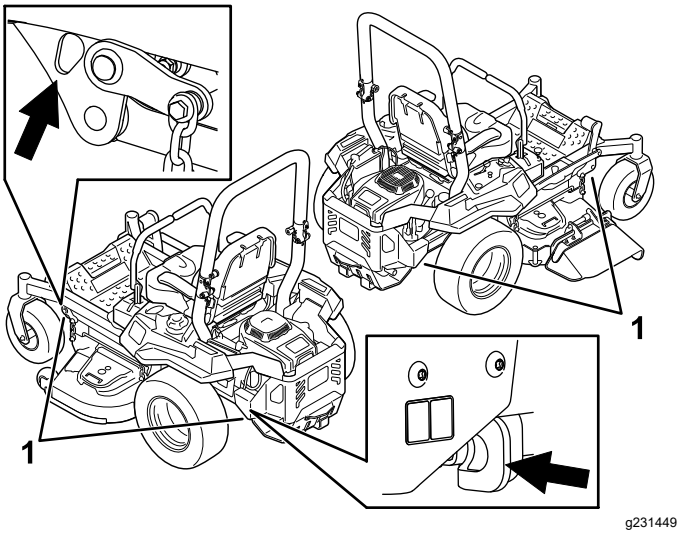


Figure 43

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 41).
2. Drive the machine forward down the ramp (Figure 42).

Maintenance

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first 5 hours	• For Toro engines—change the engine oil and filter.
After the first 75 hours	• Change the hydraulic-system filters and fluid.
Before each use or daily	• Check the safety-interlock system. • For Kawasaki engines—check the engine-oil level. • For Kohler engines—check the air cleaner for dirty, loose, or damaged parts. • For Kohler engines—check the engine-oil level. • Clean the blower housing (more often under dusty, dirty conditions). • For Toro engines—check the engine-oil level. • Clean the air intake screen. • Check the seat belt. • Check the roll bar knobs. • Clean the engine screen and the area around the engine. • Clean around the engine-exhaust system. • Check the hydraulic fluid level in the expansion tank. • Inspect the blades. • Clean the mower deck. • Clean the suspension system.
Every 25 hours	• Grease the front caster axles. (more often in dirty or dusty conditions). • For Kohler engines—service or replace the air-cleaner foam element (more often under dusty, dirty conditions). • For Toro engines with a standard air cleaner—clean the air-cleaner foam element (more often in dusty, dirty conditions).
Every 50 hours	• Grease the pump-idler pivot. • Check the spark arrester (if equipped). • Check the tire pressure. • Inspect the belts for cracks and wear.
Every 100 hours	• For Kawasaki engines—change the engine oil (more often in dirty or dusty conditions). • For Kawasaki engines—replace or clean and gap the spark plug. • For Kohler engines—replace the air-cleaner paper element (more often under dusty, dirty conditions). • For Kohler engines—change the engine oil and the engine-oil filter. • For Kohler engines—clean the cooling fins (more often under dusty, dirty conditions). • For Toro engines with a standard air cleaner—replace the air-cleaner foam element (more often in dusty, dirty conditions). • For Toro engines with a standard air cleaner—service the air-cleaner paper element (more often in dusty, dirty conditions). • For Toro engines—change the engine oil and oil filter (more often in dusty, dirty conditions). • For Toro engines—check the spark plug(s).
Every 200 hours	• For Kawasaki engines—change the engine-oil filter (more often in dirty or dusty conditions). • For Kohler engines—check the spark plug(s). • For Toro engines with a standard air cleaner—replace the air-cleaner paper element (more often in dusty, dirty conditions). • For Toro engines—replace the spark plug(s).

Maintenance Service Interval	Maintenance Procedure
Every 250 hours	• For Kawasaki engines—replace the primary air filter (more often in dusty or sandy conditions). • For Kawasaki engines—check the safety air filter (more often in dusty or sandy conditions). • For Toro engines with a heavy-duty air cleaner—replace the air filter (more often in dusty or sandy conditions). • After the initial change—change the hydraulic-system filters and fluid when using Mobil 1 15W50 fluid (change it more often under severe conditions).
Every 300 hours	• For Kawasaki engines—Check and adjust the valve clearance. See an Authorized Service Dealer.
Every 500 hours	• For Kawasaki engines—replace the safety air filter (more often in dusty or sandy conditions). • For Kohler engines—Check and adjust the valve clearance. See an Authorized Service Dealer. • For Kohler engines—replace the spark plug(s). • Replace the emissions-air intake filter. • Replace the fuel filter (more often in dusty, dirty conditions). • Check the parking brake adjustment. • After the initial change—change the hydraulic-system filters and fluid when using Toro® HYPR-OIL™ 500 fluid (change it more often under severe conditions).
Monthly	• Check the battery charge.
Yearly	• For 2500 Series machines—Lubricate the caster-wheel hubs.
Yearly or before storage	• Paint chipped surfaces. • Check all maintenance procedures listed above before storage.

⚠ 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.

Pre-Maintenance Procedures

Maintenance Safety

- Before repairing the machine do the following:
  - Disengage the drives.
  - Engage the parking brake.
  - Shut off the engine and remove the key.
  - Disconnect the spark-plug wire.
- 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 or remove the spark-plug wire 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.

- Check the parking brake operation frequently. Adjust and service as required.

Lubrication

Greasing the Machine

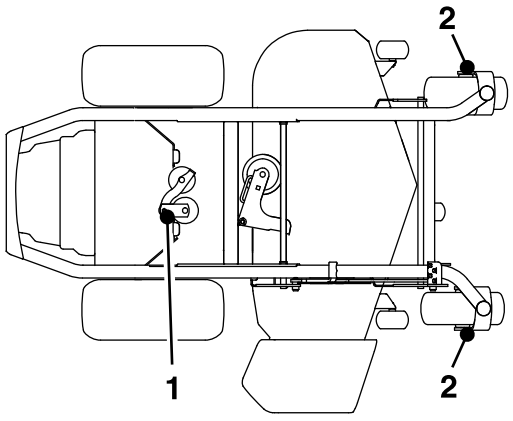
Service Interval: Every 25 hours—Grease the front caster axles. (more often in dirty or dusty conditions).

Every 50 hours—Grease the pump-idler pivot.

Grease 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; refer to Engaging the Parking Brake (page 26).
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Clean the grease fittings with a rag.

   Note: Scrape any paint off the front of the fitting(s).
4. Grease the pump idler-pulley pivot with 1 or 2 pumps of grease (Figure 44).
5. Grease the front caster axles (Figure 44).



g188563

Figure 44

1. Pump-idler pivot
2. Caster axle

6. Wipe up any excess grease.

Lubricating the Caster-Wheel Hubs

2500 Series Machines Only

Service Interval: Yearly—For 2500 Series machines—Lubricate the caster-wheel hubs.

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 caster wheel from the caster forks.
4. Remove the seal guards from the wheel hub (Figure 45).

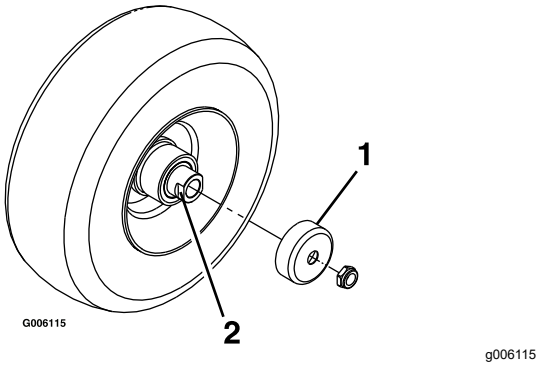


Figure 45

1. Seal guard
2. Spacer nut with wrench flats

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

   Note: Thread-locking compound has been applied to lock the spacer nuts to the axle.
6. Remove the axle (with the other spacer nut still assembled to it) from the wheel assembly.
7. Pry out seals and inspect bearings for wear or damage and replace if necessary.
8. Pack the bearings with a general-purpose grease.
9. Insert 1 bearing and 1 new seal into the wheel.

   Note: Replace the seals.
10. If both spacer nuts have been removed (or broken loose) from the axle assembly, apply a thread-locking compound to 1 spacer nut and thread it onto the axle with the wrench flats facing outward.

    Note: Do not thread the spacer nut all of the way onto the end of the axle. Leave approximately 3 mm (1/8 inch) from the outer surface of the spacer nut to the end of the axle inside the nut.
11. Insert the assembled nut and axle into the wheel on the side with the new seal and bearing.
12. With the open end of the wheel facing up, fill the area inside the wheel around the axle full of general-purpose grease.
13. Insert the second bearing and new seal into the wheel.
14. Apply a thread-locking compound to the second spacer nut and thread it onto the axle with the wrench flats facing outward.
15. Torque the nut to 8 to 9 N·m (75 to 80 in-lb), loosen the nut, then torque it to 2 to 3 N·m (20 to 25 in-lb).

    Note: Make sure that the axle does not extend beyond either nut.
16. Install the seal guards over the wheel hub and insert wheel into the caster fork.
17. Install the caster bolt and tighten the nut fully.

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

Engine Maintenance

Identifying the Engine

Use the following graphic to identify the engine you have and proceed to the section listed below for service (Figure 46).

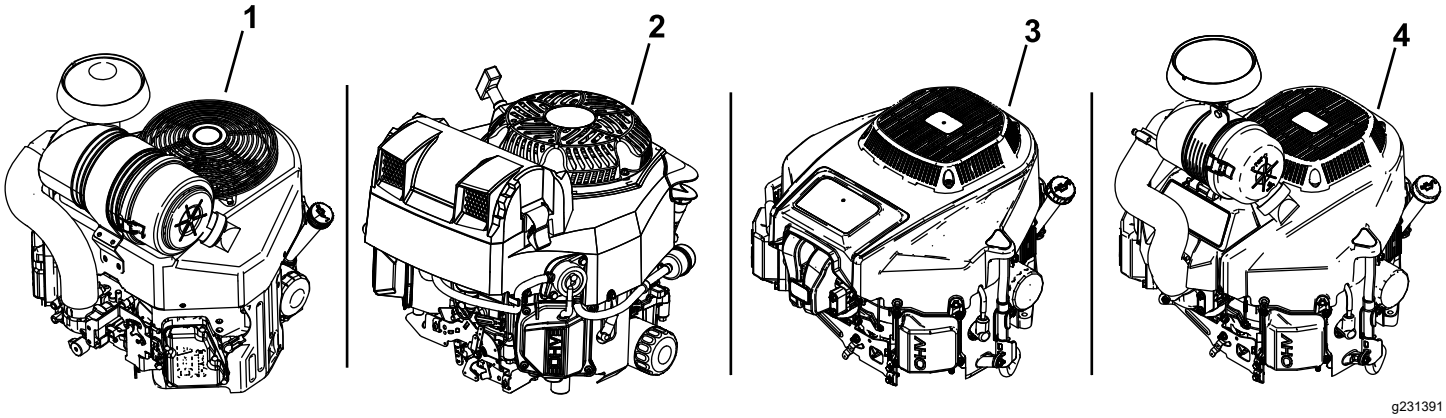


Figure 46

1. Kawasaki engine
2. Kohler engine
3. Toro engine with standard air cleaner
4. Toro engine with heavy-duty air cleaner

- For Kawasaki engine maintenance, refer to Servicing a Kawasaki® Engine (page 42).
- For Kohler engine maintenance, refer to Servicing a Kohler® Engine (page 47).
- For Toro engine maintenance, refer to Servicing a Toro Engine (page 52).

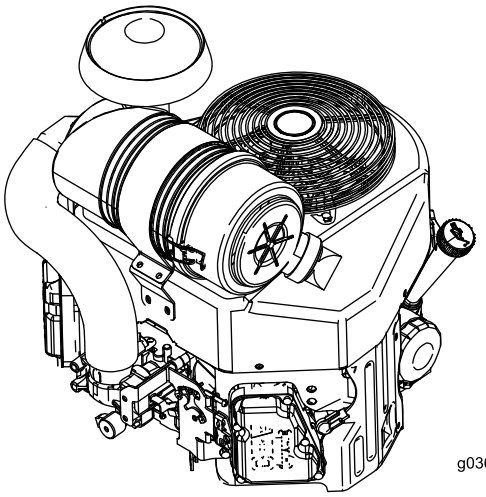
Engine Safety

- 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 a Kawasaki® Engine

This section is only for machines with Kawasaki engines. If your engine looks like the one shown in Figure 47, you have a Kawasaki engine.

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



g036714

Figure 47

Servicing the Air Cleaner

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

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

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

Note: Check the filters more frequently if the operating conditions are extremely dusty or sandy.

Removing the Filters

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Release the latches on the air cleaner and pull the air-cleaner cover off the air-cleaner body (Figure 48).

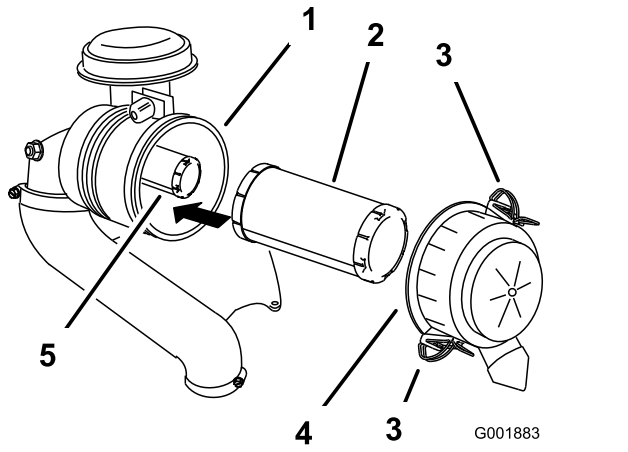


Figure 48

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

4. Clean the inside of the air-cleaner cover with compressed air.
5. Gently slide the primary filter out of the air-cleaner body (Figure 48).

   Note: Avoid knocking the filter into the side of the body.
6. Remove the safety filter only to replace it.

   Important: **Do not attempt to clean the safety filter. If the safety filter is dirty, then the primary filter is damaged. Replace both filters.**
7. Inspect the primary filter for damage by looking into the filter while shining a bright light on the outside of the filter.

   Note: Holes in the filter appear as bright spots. If the filter is damaged, discard it.

Inspecting the Filters

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

   Important: **Do not attempt to clean the safety filter. If the safety filter is dirty, then the primary filter is damaged.**
2. Inspect the primary filter for damage by looking into the filter while shining a bright light on the outside of the filter. If the primary filter is dirty, bent, or damaged, replace it.

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

Installing the Filters

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

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

   Note: Do not use a damaged filter.
2. If you are replacing the inner filter, carefully slide it into the filter body (Figure 48).
3. Carefully slide the primary filter over the safety filter (Figure 48).

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

   Important: **Do not press on the soft, inside area of the filter.**
4. Install the air-cleaner cover and secure the latches (Figure 48).

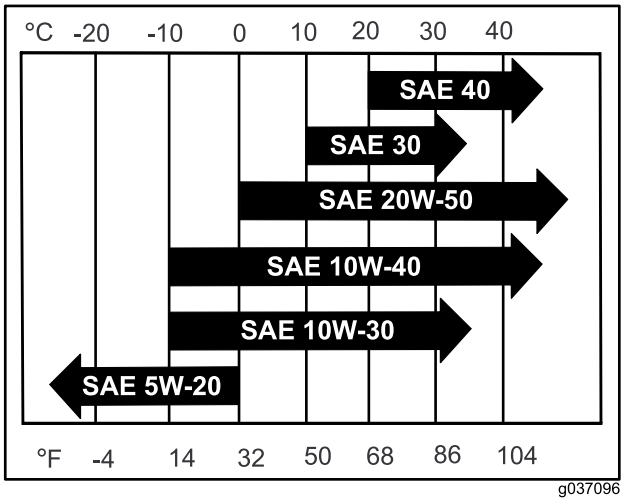
Servicing the Engine Oil

Engine-Oil Specifications

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

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

Viscosity: See the table below.



g037096

Figure 49

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

Checking the Engine-Oil Level

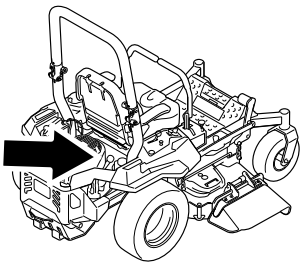
Service Interval: Before each use or daily

Note: Check the oil when the engine is cold.

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

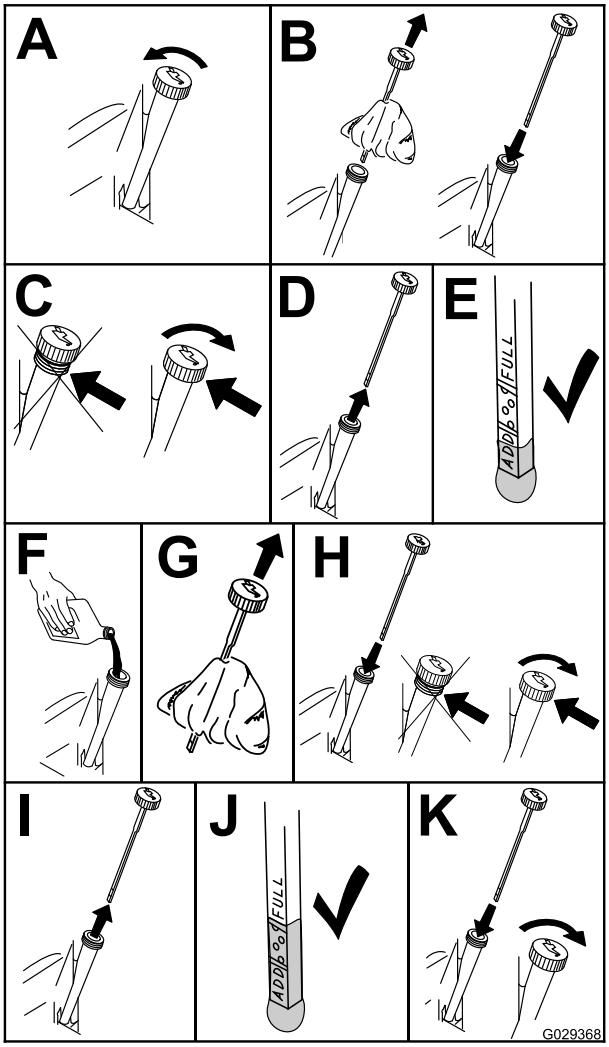
1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.

   Note: Ensure that the engine is cool so that the oil has had time to drain into the sump.
3. To keep dirt, grass clippings, and other debris, out of the engine, clean the area around the oil-fill cap and dipstick before removing it (Figure 50).



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Figure 50

Changing the Engine Oil

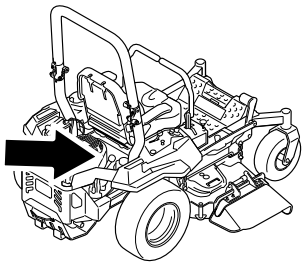
Service Interval: Every 100 hours (more often in dirty or dusty conditions).

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

1. Start the engine and let it run for 5 minutes.

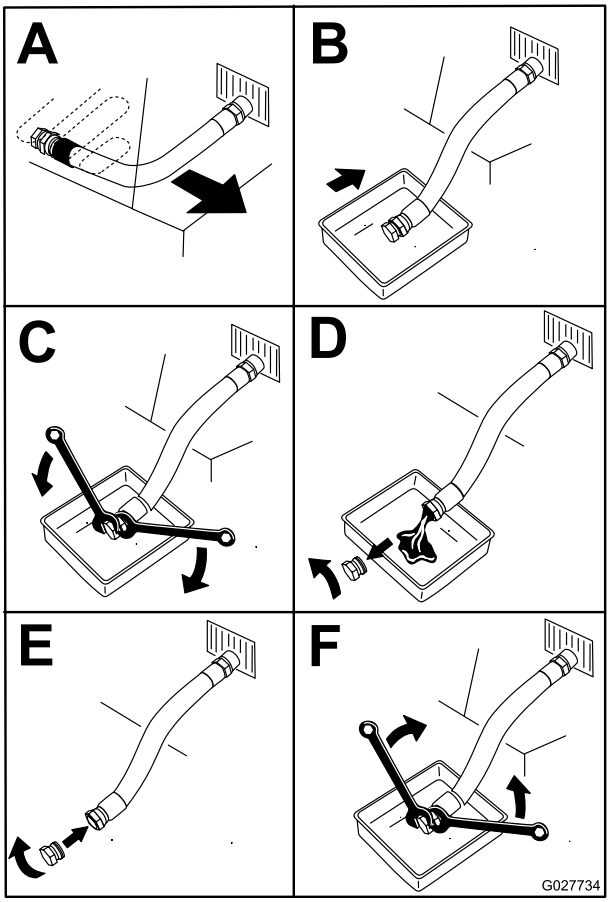
   Note: This warms the oil so that it drains better.
2. Park the machine so that the drain side is slightly lower than the opposite side to ensure that the oil drains completely.

3. Disengage the blade-control switch (PTO) and engage the parking brake.
4. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
5. Drain the oil from the engine (Figure 51).



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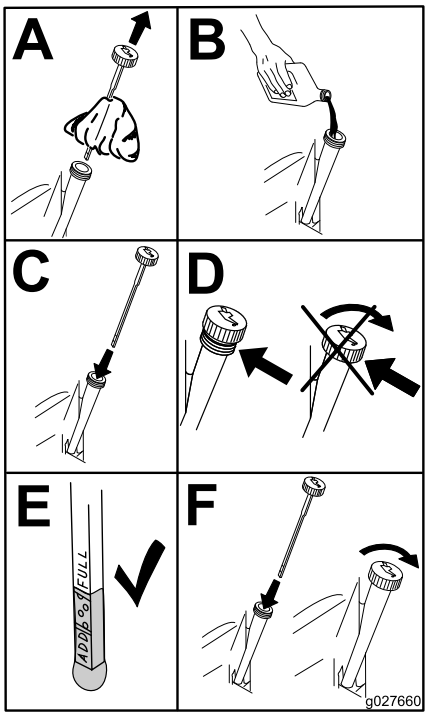
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Figure 51

6. Slowly pour approximately 80% of the specified oil into the filler tube and slowly add the additional oil to bring it to the Full mark (Figure 52).



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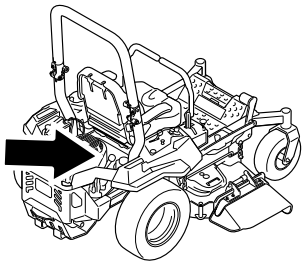
Figure 52

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

Changing the Engine-Oil Filter

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

1. Drain the oil from the engine; refer to Changing the Engine Oil (page 44).
2. Change the engine-oil filter (Figure 53).



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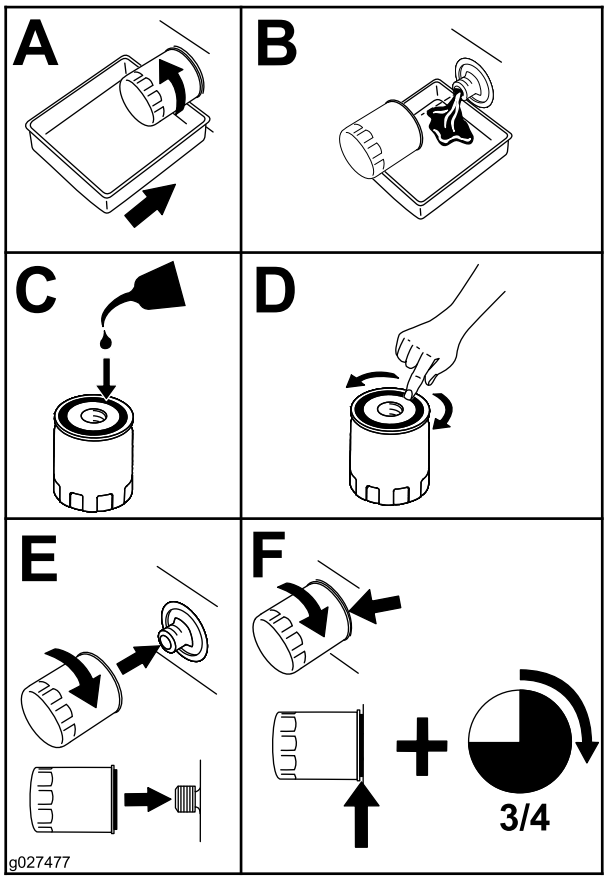


Figure 53

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

3. Fill the crankcase with the proper type of new oil; refer to Engine-Oil Specifications (page 44).

Servicing the Spark Plug

Service Interval: Every 100 hours

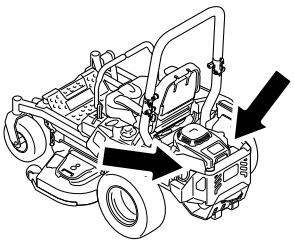
Ensure that the air gap between the center and side electrodes is correct before installing the spark plug. Use a spark plug wrench for removing and installing the spark plug and a gapping tool or feeler gauge to check and adjust the air gap. Install a new spark plug if necessary.

Type of Spark Plug: NGK® BPR4ES or equivalent

Air Gap: 0.75 mm (0.03 inch)

Removing the Spark Plug

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Clean the area around the base of the plug(s) to keep dirt and debris out of the engine.
4. Locate and remove the spark plug(s) as shown in Figure 54.



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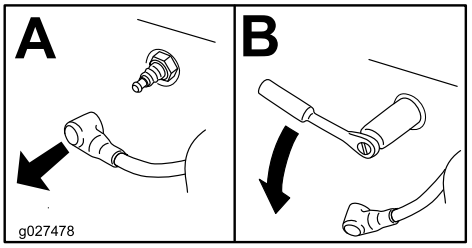


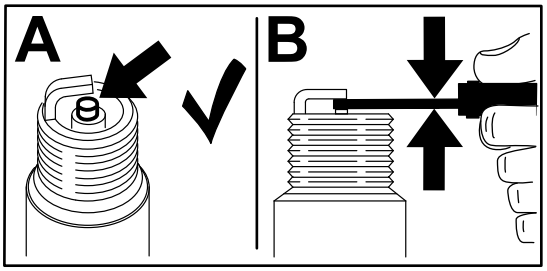
Figure 54

Checking the Spark Plug

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

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

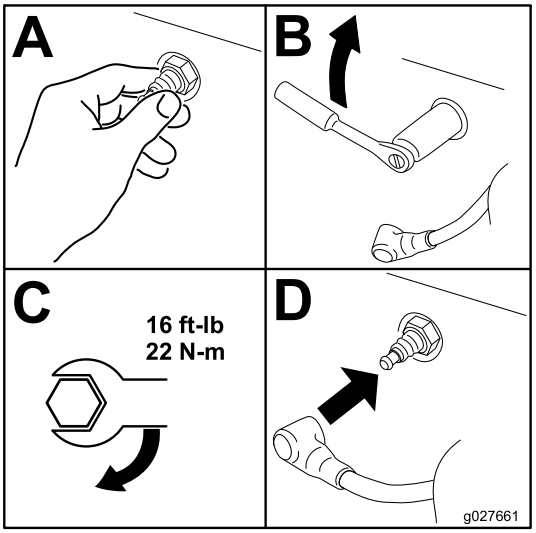
Set the gap to 0.75 mm (0.03 inch).



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Figure 55

Installing the Spark Plug



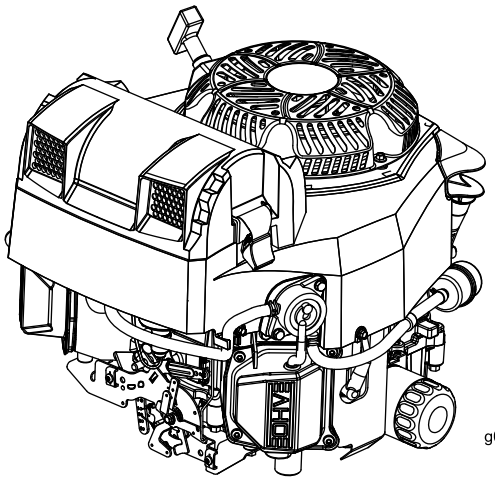
g027661

Figure 56

Servicing a Kohler® Engine

This section is only for machines with Kohler engines. If your engine looks like the one shown in Figure 57, you have a Kohler engine.

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



g036713

g036713

Figure 57

Servicing the Air Cleaner

Service Interval: Before each use or daily—For Kohler engines—check the air cleaner for dirty, loose, or damaged parts.

Every 25 hours—For Kohler engines—service or replace the air-cleaner foam element (more often under dusty, dirty conditions).

Every 100 hours—For Kohler engines—replace the air-cleaner paper element (more often under dusty, dirty conditions).

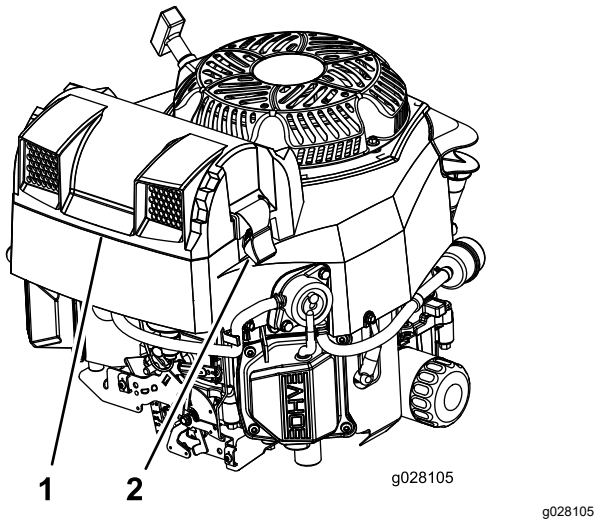
This engine is equipped with a replaceable, high-density paper and foam air-cleaner element. Check the air cleaner daily or before starting the engine. Check for a buildup of dirt and debris around the air-cleaner system. Keep this area clean. Also, check for loose or damaged components. Replace all bent or damaged air-cleaner components.

Note: Operating the engine with loose or damaged air-cleaner components could allow unfiltered air into the engine, causing premature wear and failure.

Note: Service the air cleaner more often under dusty, dirty conditions.

Removing the Elements

1. Rotate the latches outward.
2. Remove the cover to access the air-cleaner elements (Figure 58).

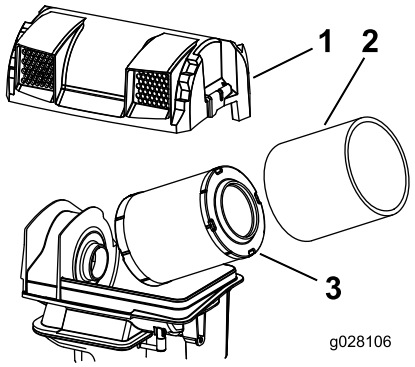


g028105

Figure 58

1. Air-cleaner cover
2. Air-cleaner latch

3. Remove the foam and paper elements (Figure 59).
4. Remove the foam element from the paper element (Figure 59).



g028106

Figure 59

1. Air-cleaner cover
2. Foam element
3. Paper element

Servicing the Foam Element

1. Wash the foam element in liquid soap and warm water. When the element is clean, rinse it thoroughly.
2. Dry the element by squeezing it in a clean cloth.

   Important: **Replace the foam element if it is torn or worn.**

Servicing the Paper Element

1. Gently tap the paper element to dislodge dirt.

   Note: Do not wash the paper element or use pressurized air, as this will damage the element.

   Note: Replace a dirty, bent, or damaged element. Handle the new element carefully; do not use if the sealing surfaces are bent or damaged.
2. Clean the air-cleaner base as required, and check the condition.

Installing the Elements

1. Install the foam element onto the paper element.
2. Install the elements onto the air-cleaner base (Figure 59).
3. Install the cover, and secure it with the latches (Figure 58).

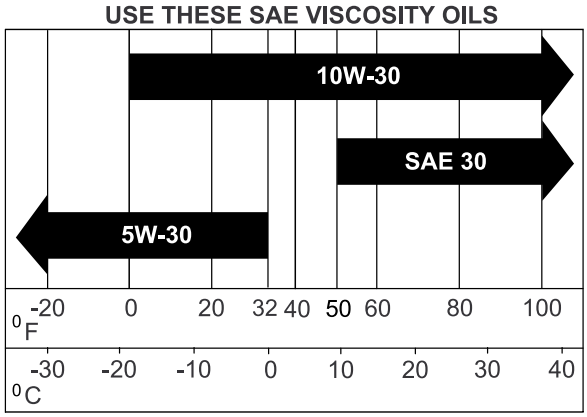
Servicing the Engine Oil

Engine Oil Specifications

Oil Type: Detergent oil (API service SJ or higher)

Crankcase Capacity: 1.9 L (64 fl oz) with the oil filter

Viscosity: See the table below.



g017552

Figure 60

Checking the Engine-Oil Level

Service Interval: Before each use or daily

Note: Check the oil when the engine is cold.

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

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

2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.

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

3. To keep dirt, grass clippings, etc., out of the engine, clean the area around the oil-fill cap and dipstick before removing it (Figure 50).

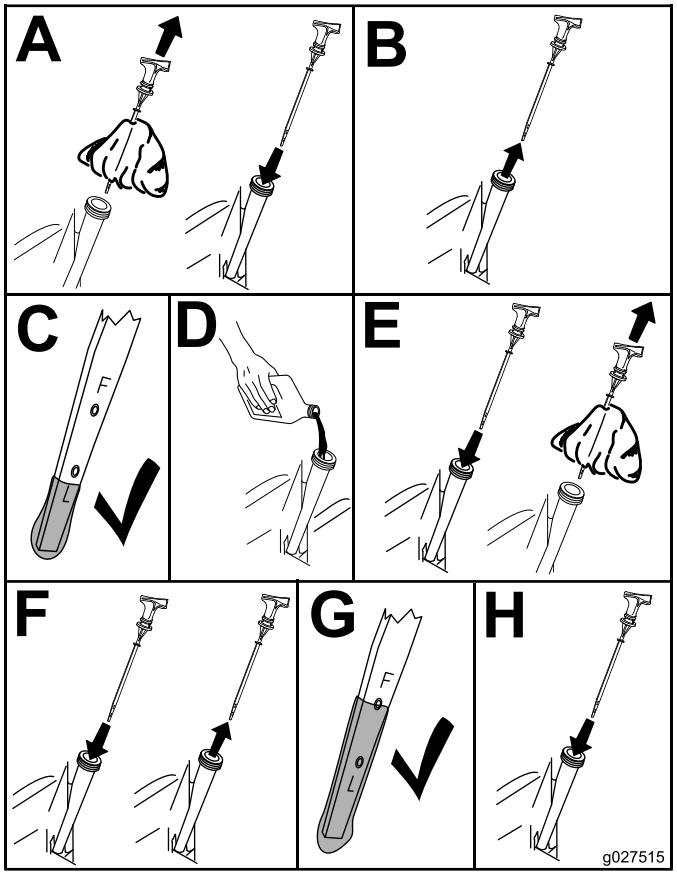


Figure 61

Changing the Engine Oil and the Engine-Oil Filter

Service Interval: Every 100 hours—For Kohler engines—change the engine oil and the engine-oil filter.

Note: The drain plug is attached to the drain hose.

1. Park the machine so that the drain side is slightly lower than the opposite side to ensure that the oil drains completely.
2. Disengage the blade-control switch (PTO) and engage the parking brake.
3. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
4. Drain the oil from the engine.

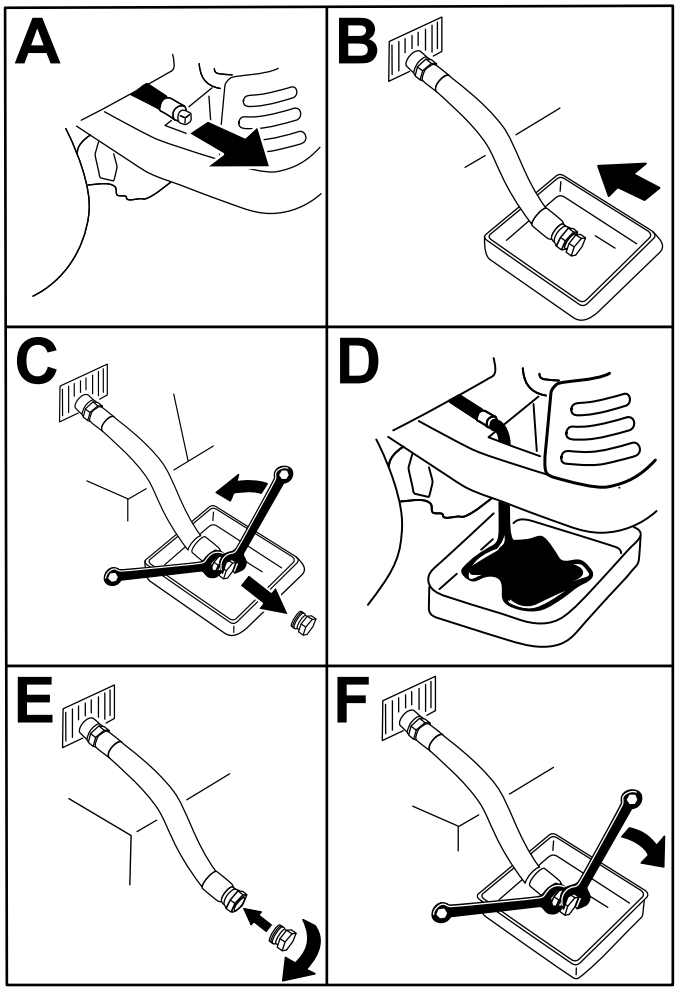


Figure 62

5. Torque the plug to 14 N·m (125 in-lb).

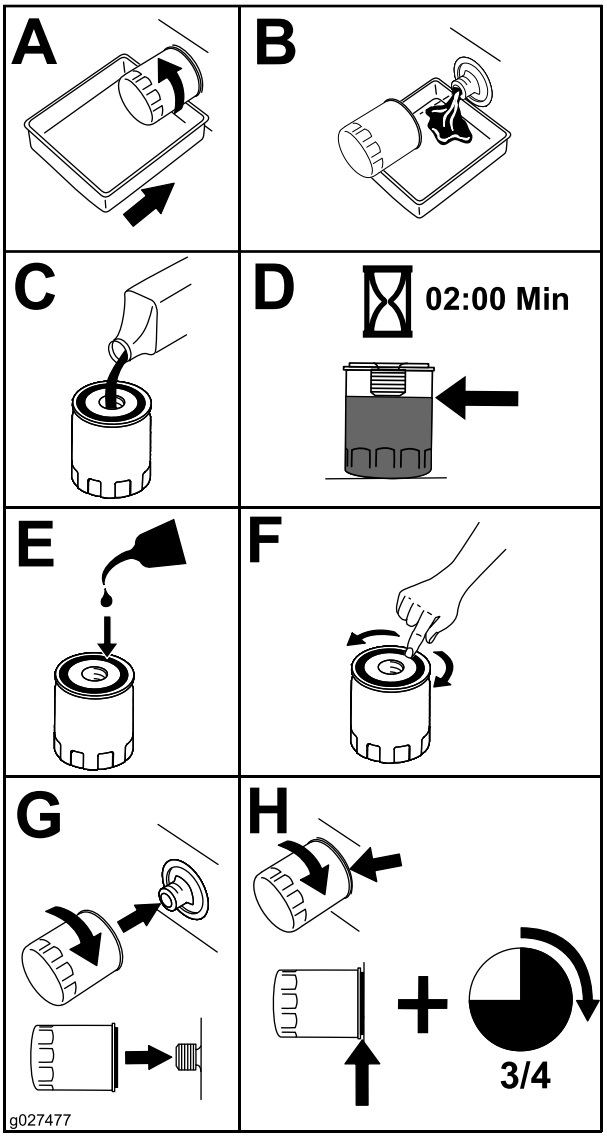


Figure 63

6. Slowly pour approximately 80% of the specified oil into the filler tube and slowly add the additional oil to bring it to the Full mark (Figure 64).

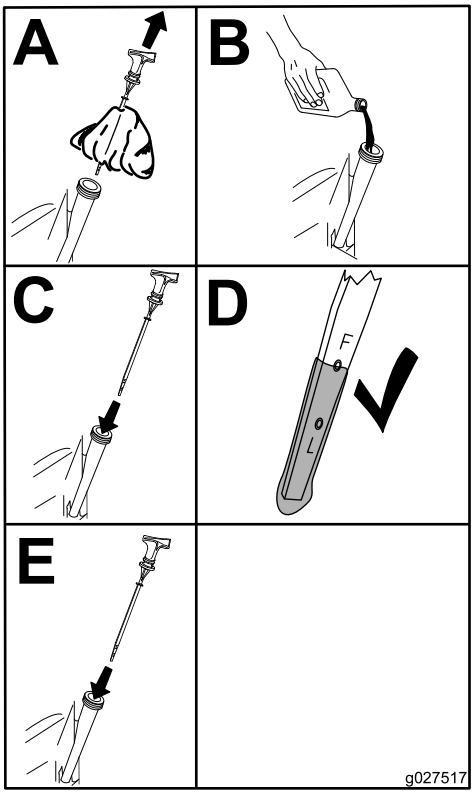


Figure 64

7. Dispose the used oil at a recycling center.

Servicing the Spark Plug

Service Interval: Every 200 hours—For Kohler engines—check the spark plug(s).

Every 500 hours—For Kohler engines—replace the spark plug(s).

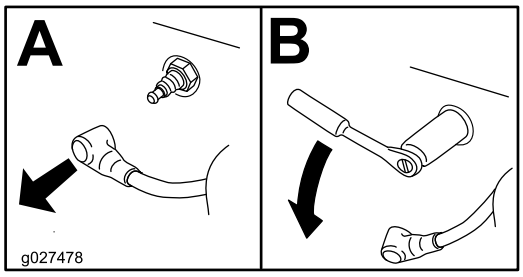
The spark plug is RFI compliant; you can also use an equivalent plug.

Type: Champion XC12YC

Air Gap: 0.76 mm (0.03 inch)

Removing the Spark Plug

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Clean the area around the base of the plug to keep dirt and debris out of the engine.
4. Remove the spark plug (Figure 65).



g027478

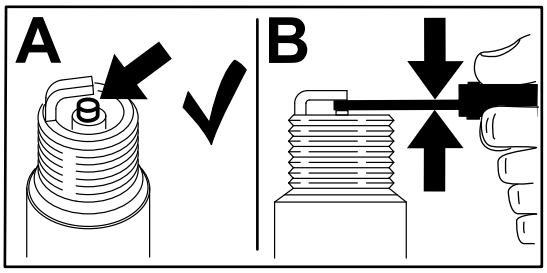
Figure 65

Checking the Spark Plug

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

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

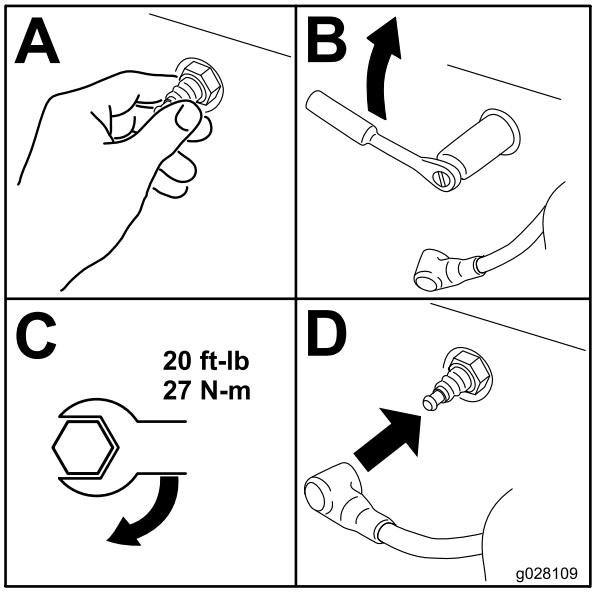
Set the gap to 0.76 mm (0.03 inch).



g206628

Figure 66

Installing the Spark Plug



g028109

Figure 67

Cleaning the Blower Housing

Every 100 hours/Yearly (whichever comes first)—For Kohler engines—clean the cooling fins (more often under dusty, dirty conditions).

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

For Kohler engines, remove the blower housing, and any other cooling shrouds. Clean the cooling fins and external surfaces as necessary. Make sure that the cooling shrouds are installed.

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

Servicing a Toro Engine

This section is only for machines with Toro engines. If your engine looks like 1 of the 2 engines shown in Figure 68, you have a Toro engine.

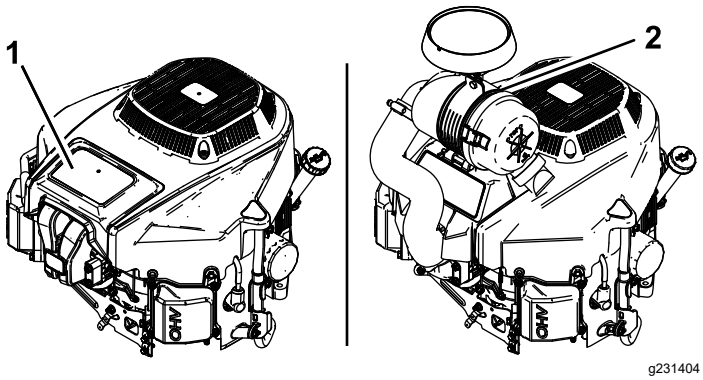


Figure 68

1. Standard air cleaner
2. Heavy-duty air cleaner

Servicing the Air Cleaner

Engines with a Standard Air Cleaner

Service Interval: Every 25 hours/Monthly (whichever comes first)—For Toro engines with a standard air cleaner—clean the air-cleaner foam element (more often in dusty, dirty conditions).

Every 100 hours/Yearly (whichever comes first)—For Toro engines with a standard air cleaner—replace the air-cleaner foam element (more often in dusty, dirty conditions).

Every 100 hours/Yearly (whichever comes first)—For Toro engines with a standard air cleaner—service the air-cleaner paper element (more often in dusty, dirty conditions).

Every 200 hours/Every 2 years (whichever comes first)—For Toro engines with a standard air cleaner—replace the air-cleaner paper element (more often in dusty, dirty conditions).

Removing the Foam and Paper Elements

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 air-cleaner cover to prevent dirt from getting into the engine and causing damage.
4. Lift the cover and rotate the air-cleaner assembly out of the engine (Figure 69).

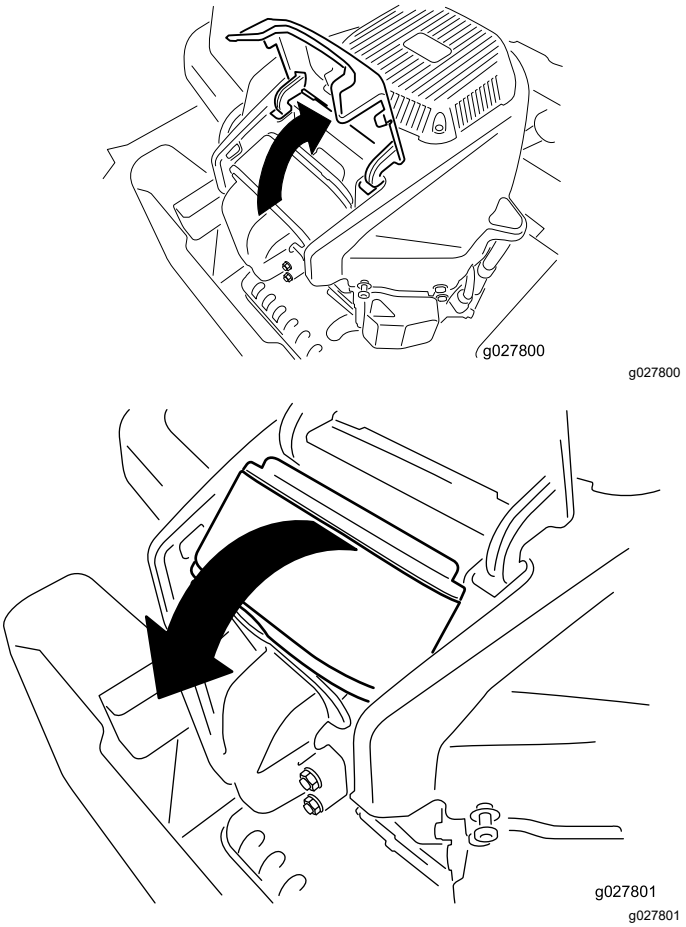


Figure 69

5. Separate the foam and paper elements (Figure 70).

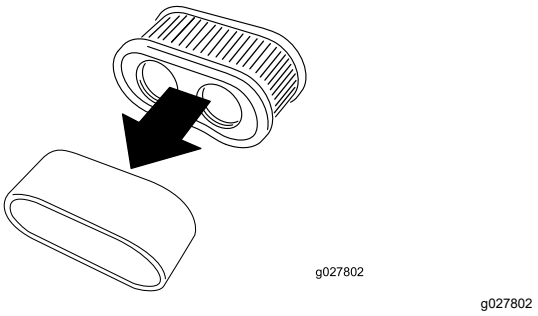


Figure 70

Servicing the Foam Element

1. Wash the foam element in liquid soap and warm water. When the element is clean, rinse it thoroughly.
2. Dry the element by squeezing it in a clean cloth.

Important: **Replace the foam element if it is torn or worn.**

Servicing the Paper Element

1. Gently tap the paper element to dislodge dirt.

   Note: Do not wash the paper element or use pressurized air, as this will damage the element.

   Note: Replace a dirty, bent, or damaged element. Handle the new element carefully; do not use if the sealing surfaces are bent or damaged.

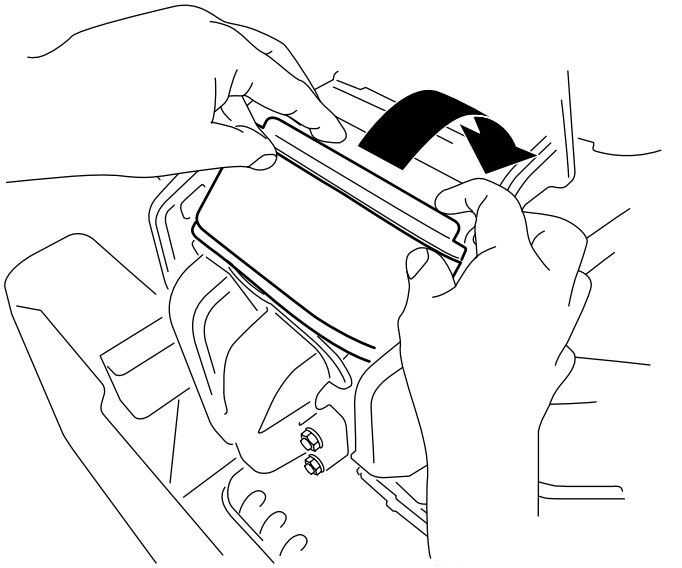
2. Clean the air-cleaner base as required, and check the condition.

Installing the Air Cleaner

1. Install the foam element over the paper element.

   Note: Ensure that you do not damage the elements.

2. Align the holes of the filter into the manifold ports.
3. Rotate the filter down into the chamber and fully seat it against the manifold (Figure 71).



g228022

Figure 71

4. Close the cover.

Servicing the Air Cleaner

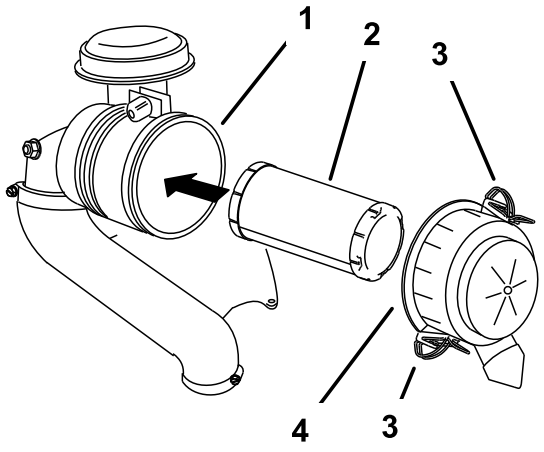
Engines with a Heavy-Duty Air Cleaner

Service Interval: Every 250 hours—For Toro engines with a heavy-duty air cleaner—replace the air filter (more often in dusty or sandy conditions).

Note: Check the filters more frequently if the operating conditions are extremely dusty or sandy.

Removing the Filters

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Release the latches on the air cleaner and pull the air-cleaner cover off the air-cleaner body (Figure 73).



g230914

Figure 72

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

4. Clean the inside of the air-cleaner cover with compressed air.
5. Gently slide the filter out of the air-cleaner body (Figure 73).

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

Inspecting the Filter

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

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

Installing the Filters

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

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

   Note: Do not use a damaged filter.

2. Carefully slide the filter into the air-cleaner body (Figure 73).

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

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

3. Install the air-cleaner cover and secure the latches (Figure 73).

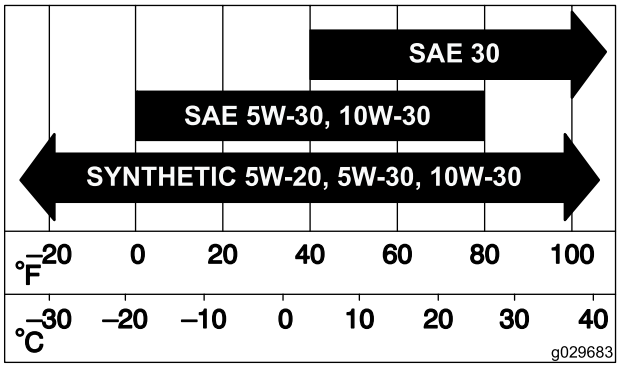
Servicing the Engine Oil

Engine-Oil Specifications

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

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

Viscosity: See the table below.



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Figure 73

Checking the Engine-Oil Level

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

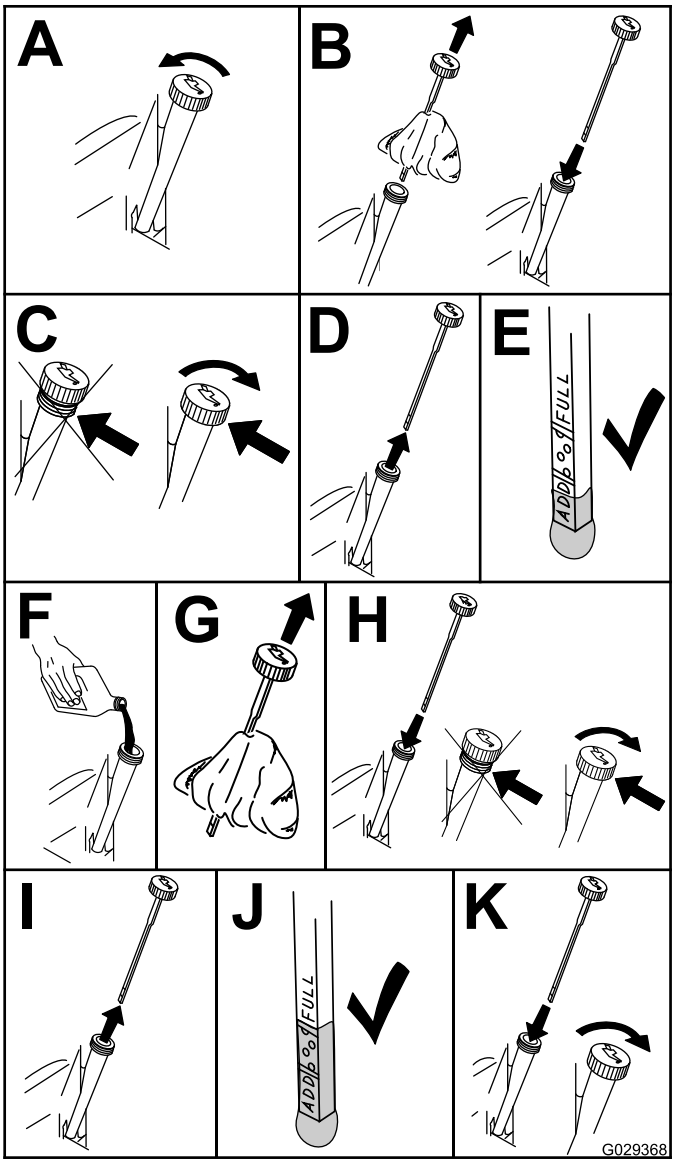
Note: Check the oil when the engine is cold.

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

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

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

3. To keep dirt, grass clippings, etc., out of the engine, clean the area around the oil-fill cap and dipstick before removing it (Figure 50).



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Figure 74

Changing the Engine Oil and Oil Filter

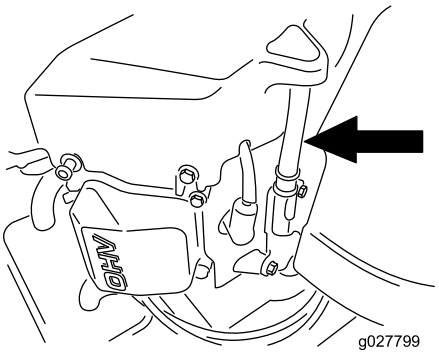
Service Interval: After the first 5 hours/After the first month (whichever comes first)—For Toro engines—change the engine oil and filter.

Every 100 hours/Yearly (whichever comes first)—For Toro engines—change the engine

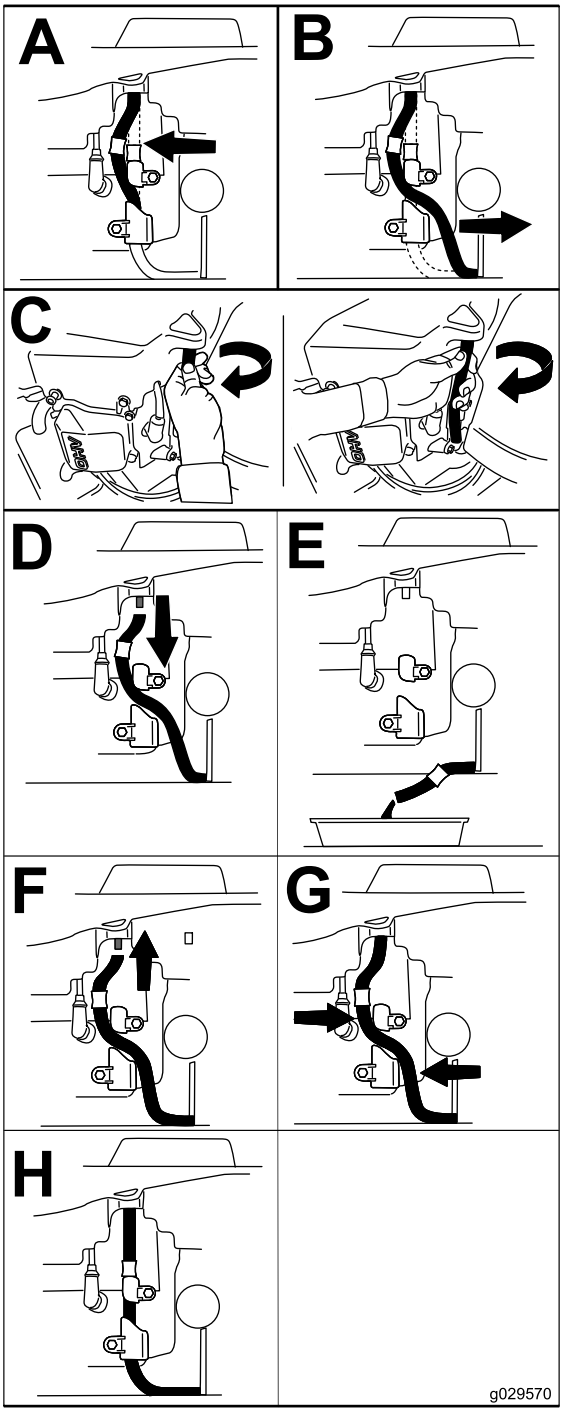
oil and oil filter (more often in dusty, dirty conditions).

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

1. Park the machine on a level surface to ensure that the oil drains completely.
2. Disengage the blade-control switch (PTO) and engage the parking brake.
3. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
4. Drain the oil from the engine (Figure 75).



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g029570

Figure 75

5. Change the engine-oil filter (Figure 76).

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

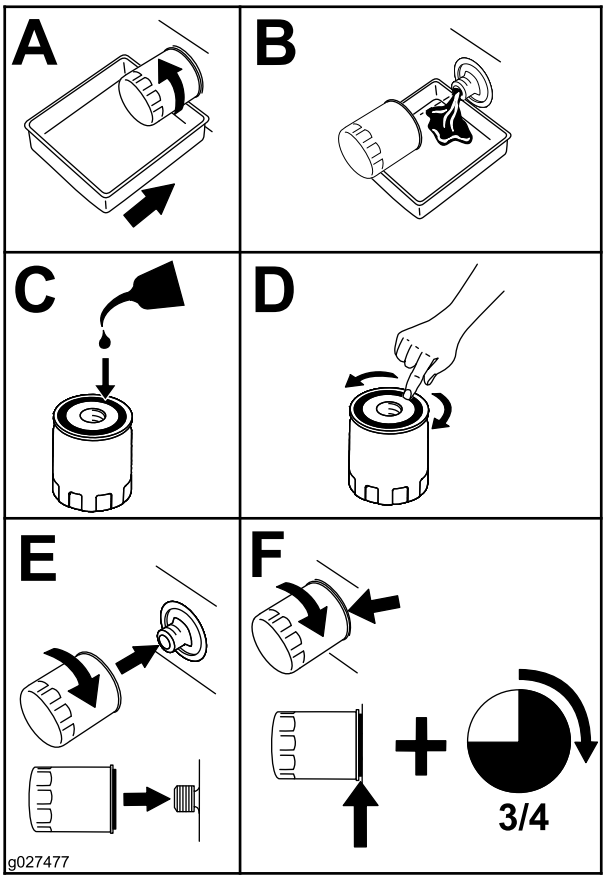


Figure 76

6. Slowly pour approximately 80% of the specified oil into the filler tube and slowly add the additional oil to bring it to the Full mark (Figure 77).

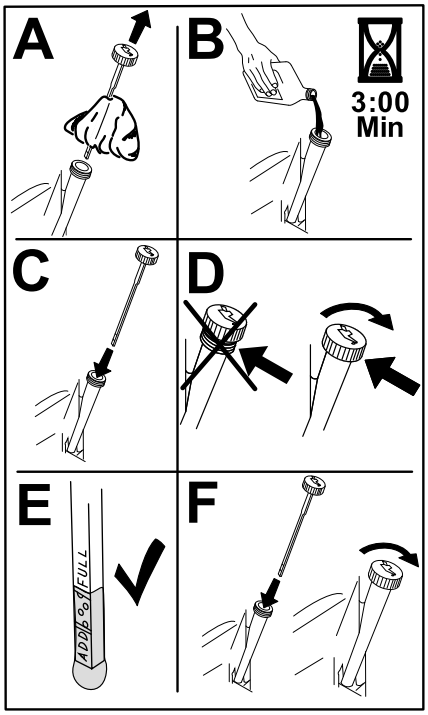


Figure 77

Servicing the Spark Plug

Service Interval: Every 100 hours/Yearly (whichever comes first)—For Toro engines—check the spark plug(s).

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

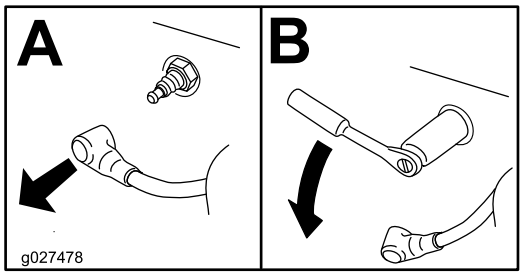
Ensure that the air gap between the center and side electrodes is correct before installing the spark plug. Use a spark plug wrench for removing and installing the spark plug and a gapping tool or feeler gauge to check and adjust the air gap. Install a new spark plug if necessary.

Type: Champion® RN9YC or NGK® BPR6ES

Air gap: 0.76 mm (0.03 inch)

Removing the Spark Plug

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Clean the area around the base of the plug to keep dirt and debris out of the engine.
4. Remove the spark plug (Figure 65).



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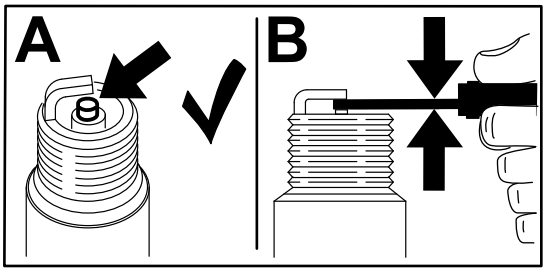
Figure 78

Checking the Spark Plug

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

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

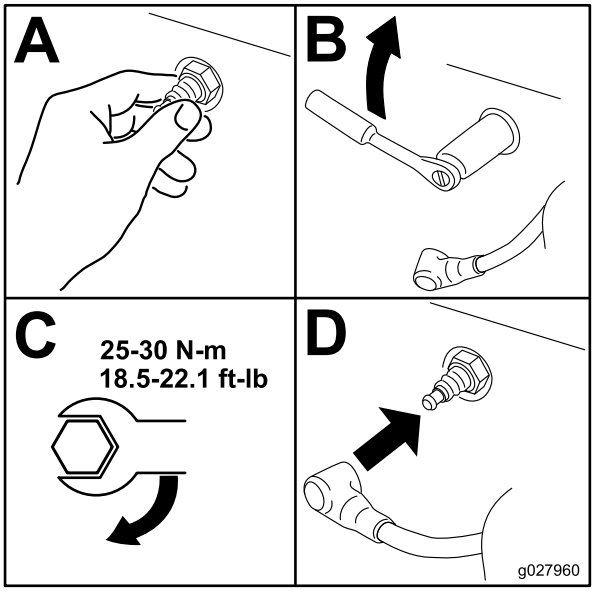
Set the gap to 0.76 mm (0.03 inch).



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Figure 79

Installing the Spark Plug



g027960

Figure 80

Cleaning the Cooling System

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

Checking the Spark Arrester

For Machines with a Spark Arrester

Service Interval: Every 50 hours

⚠ WARNING

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

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

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

Replacing the Emissions-Air Intake Filter

Service Interval: Every 500 hours

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

Fuel System Maintenance

⚠ DANGER

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

- **Perform any fuel-related maintenance when the engine is cold. Do this outdoors in an open area. Wipe up any fuel that spills.**
- **Never smoke when draining fuel, and stay away from an open flame or where a spark may ignite the fuel fumes.**

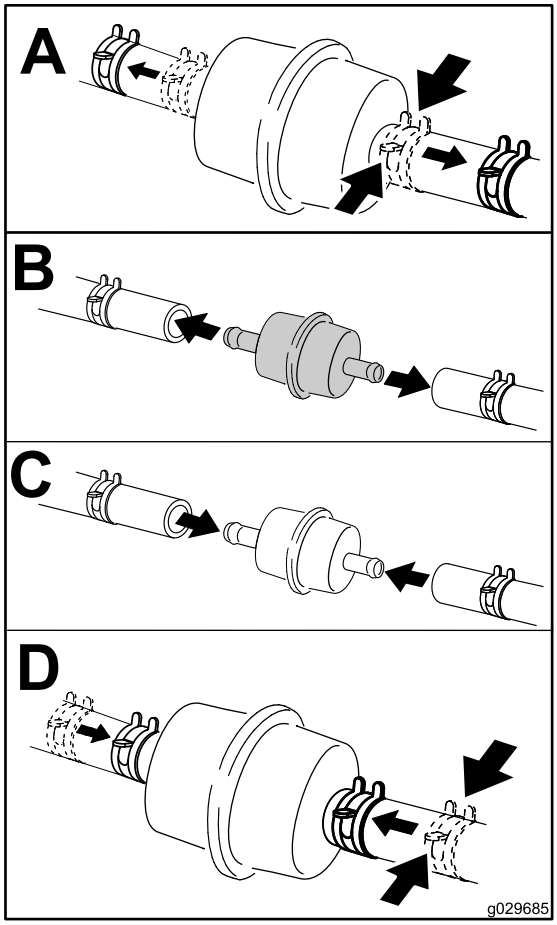
Replacing the Fuel Filter

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

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

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

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Allow the machine to cool down.
4. Close the fuel-shutoff valve under the seat (Figure 81).



g029685

Figure 81
Kohler engine filter shown

5. Open the fuel-shutoff valve.

Servicing the Fuel Tank

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

Electrical System Maintenance

Electrical System Safety

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

Servicing the Battery

Service Interval: Monthly

Removing the Battery

⚠ WARNING

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

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

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. Disconnect the negative (black) ground cable from the battery post (Figure 82).

   Note: Retain all fasteners.

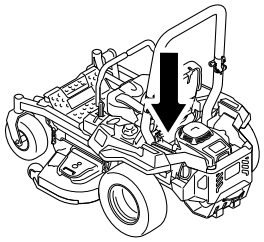
⚠ WARNING

Incorrectly removing the cables from battery could damage the machine and cables, causing sparks. Sparks can cause the battery gasses to explode, resulting in personal injury.

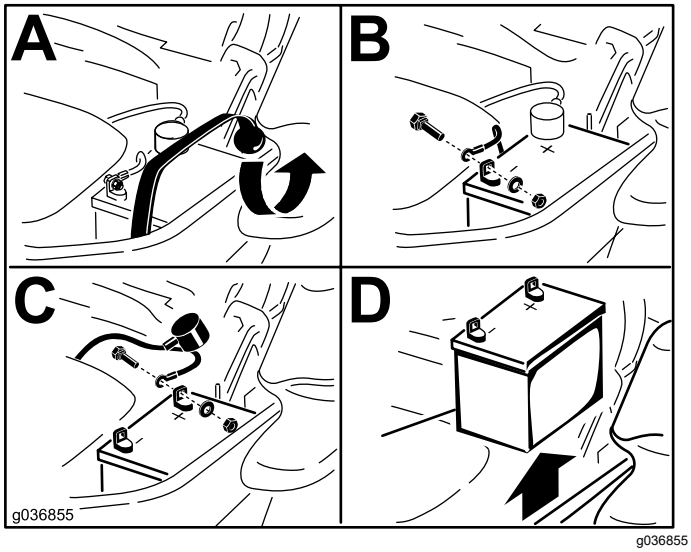
- **Always disconnect the negative (black) battery cable before disconnecting the positive (red) cable.**
- **Always connect the positive (red) battery cable before connecting the negative (black) cable.**

4. Slide the rubber cover off the positive (red) cable.
5. Disconnect the positive (red) cable from the battery post (Figure 82).

   Note: Retain all fasteners.
6. Remove the rubber strap (Figure 82).
7. Remove the battery.



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Figure 82

Charging the Battery

⚠ WARNING

Charging the battery produces gasses that can explode.

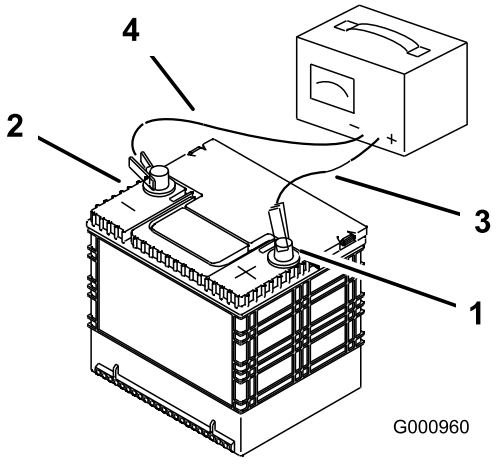
Never smoke near the battery and keep sparks and flames away from the battery.

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

1. Remove the battery from the chassis; refer to Removing the Battery (page 59).
2. Charge the battery for 10 to 15 minutes at 25 to 30 A or for 30 minutes at 10 A.

   Note: Do not overcharge the battery.
3. When the battery is fully charged, unplug the charger from the electrical outlet, then disconnect the charger leads from the battery posts (Figure 83).
4. Install the battery in the machine and connect the battery cables; refer to Installing the Battery (page 61).

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



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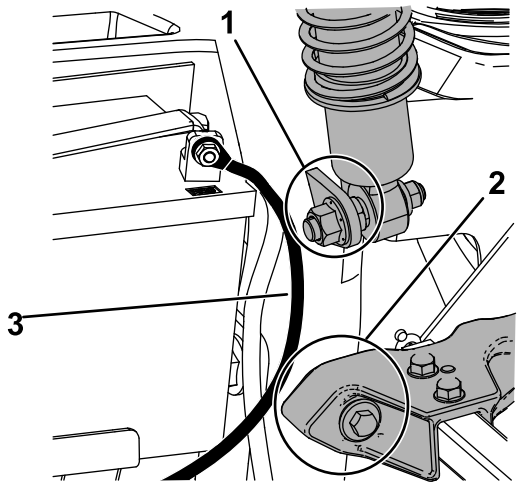
Figure 83

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

Installing the Battery

1. Position the battery in the tray with the terminal posts opposite from the hydraulic tank (Figure 82).
2. Install the positive (red) battery cable to the positive (+) battery terminal.
3. Install the negative (black) battery cable and ground wire to the negative (-) battery terminal.

   Note: For MyRide machines, ensure that the ground cable does not rub against the trailing arm or lower shock mount (Figure 84).



g236732

Figure 84

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

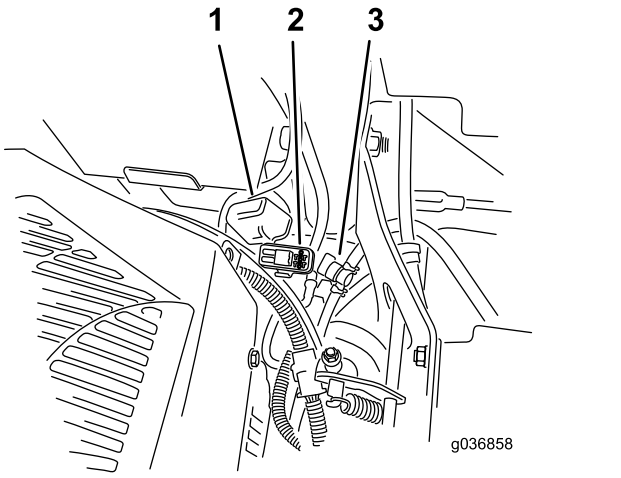
4. Secure the cables with 2 bolts, 2 washers, and 2 locknuts (Figure 82).
5. Slide the red terminal boot onto the positive (+) battery terminal.
6. Secure the battery with the rubber strap (Figure 82).

Servicing the Fuses

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

The fuses are located on the right console next to the seat (Figure 85).

1. To replace the fuses, pull out the fuse to remove it.
2. Install a new fuse (Figure 85).



g036858

Figure 85

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

Drive System Maintenance

Checking the Seat Belt

Service Interval: Before each use or daily

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

Checking the Roll-Bar Knobs

Service Interval: Before each use or daily

⚠ WARNING

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

Ensure that the seat is secured to the machine.

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

  Note: The upper hoop of the roll bar may need to be pushed forward or pulled rearward to fully engage both knobs (Figure 86 and Figure 87).

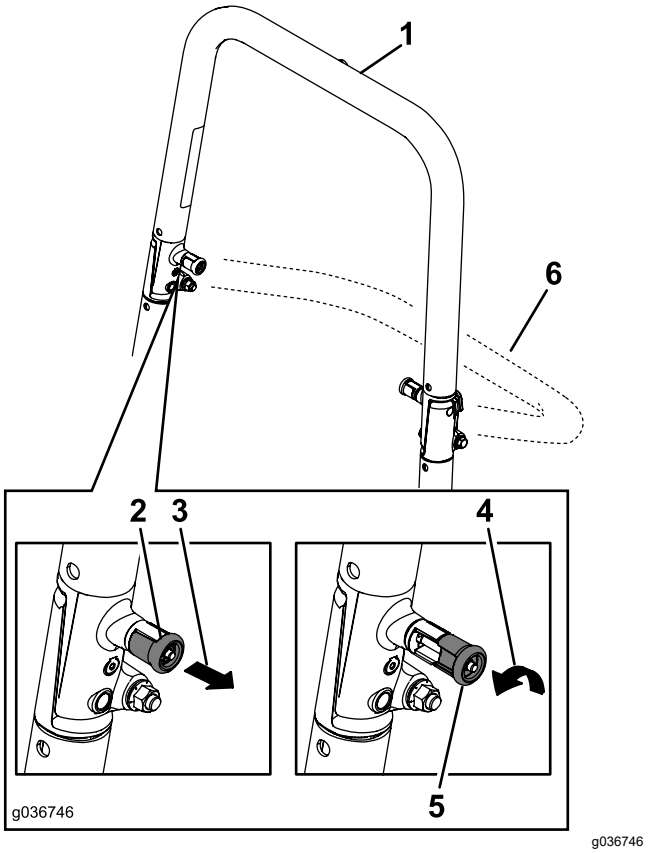


Figure 86

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

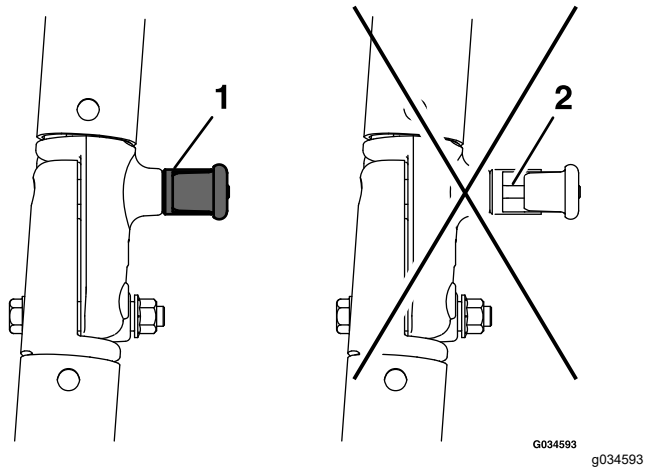


Figure 87

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

Adjusting the Tracking

1. Disengage the blade-control switch (PTO).
2. Drive to an open, flat area and move the motion-control levers to the NEUTRAL-LOCK position.
3. Move the throttle midway between the FAST and SLOW positions.
4. Move both motion-control levers forward until they both hit the stops in the T-slot.
5. Check which way the machine tracks.
6. If the machine tracks to the right, insert a 3/16 inch hex wrench through the access hole in the right front cover panel and rotate the tracking screw clockwise or counterclockwise to adjust the travel of the lever (Figure 88).
7. If the machine tracks to the left, insert a 3/16 inch hex wrench through the access hole in the right front cover panel and rotate the tracking screw clockwise or counterclockwise to adjust the travel of the lever (Figure 88).
8. Drive the machine and check the full forward tracking.
9. Repeat the adjustment until the desired tracking is obtained.

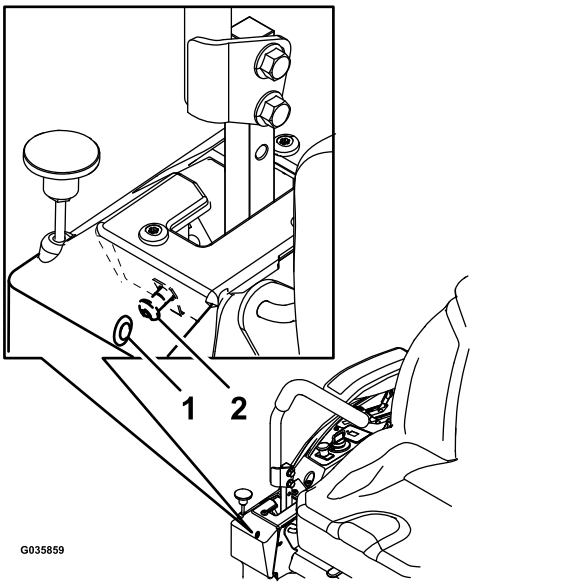


Figure 88

Right control lever shown

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

Checking the Tire Pressure

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

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

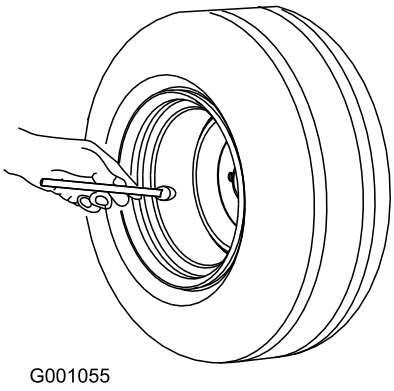


Figure 89

Checking the Wheel Lug Nuts

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

Cooling System Maintenance

Cleaning the Engine Screen

Service Interval: Before each use or daily

Before each use or daily

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

Brake Maintenance

Adjusting the Parking Brake

Service Interval: Every 500 hours

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

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Set up the machine to be pushed by hand. Refer to Using the Drive-Wheel Release Valves (page 35).
4. Raise the back of the machine up and support the machine with jack stands.

   ⚠ WARNING

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

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

5. Engage and disengage the parking brake and check each drive tire to ensure that each brake engages and disengages.
6. If an adjustment is necessary, disengage the parking brake. Remove the cotter pin from the brake linkage shaft (Figure 90).

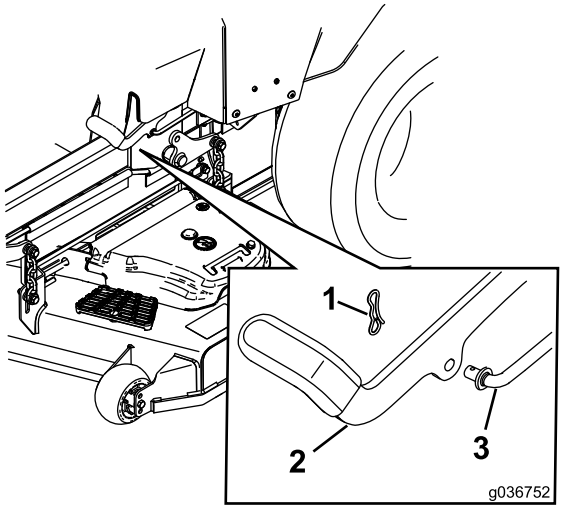


Figure 90

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

7. Check both spring lengths as shown in Figure 91. If an adjustment is necessary, turn the top nut clockwise to shorten the spring and counterclockwise to lengthen it.

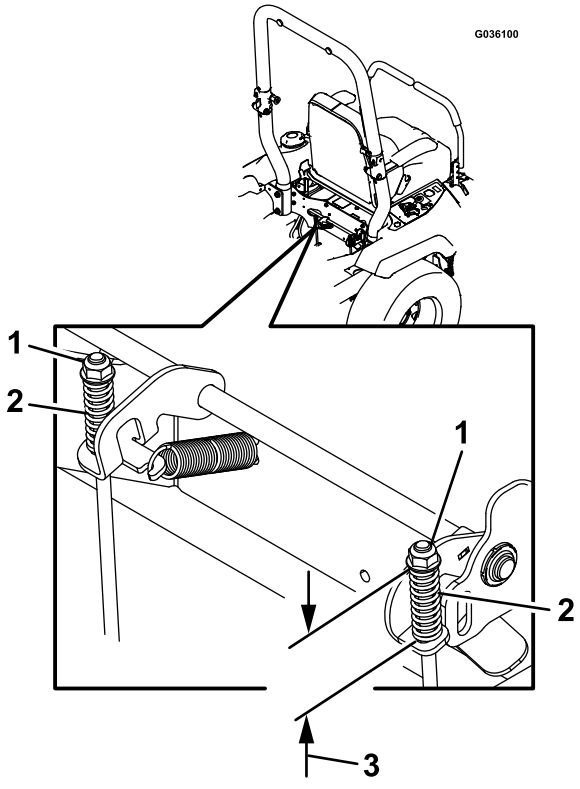


Figure 91

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

8. Push the parking brake lever all the way forward and down.
9. Rotate the brake-linkage shaft until the end aligns with the hole in the lever.
   - Shorten the linkage by turning it clockwise.
   - Lengthen the linkage by turning it counterclockwise.
10. Insert the brake-linkage shaft into the parking-brake hole and secure with the cotter pin. Repeat step 5 and adjust if necessary.
11. When adjustment is complete, remove the jack stands or equivalent support and lower the machine.
12. Place the machine into the OPERATING position. Refer to Using the Drive-Wheel Release Valves (page 35).

Belt Maintenance

Inspecting the Belts

Service Interval: Every 50 hours

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

Replacing the Mower Belt for Side-Discharge Mower Decks

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Lower the mower to the 76 mm (3 inch) height of cut.
4. Remove the belt covers (Figure 92).

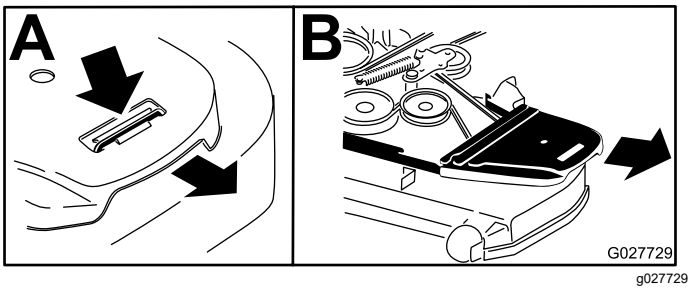


Figure 92

5. Remove the spring tension from the spring-loaded idler pulley. Refer to Figure 94 or Figure 95.

   Note: For 1500 and 2000 Series mower decks, use the spring removal tool (Toro Part No. 92-5771) to remove the spring from the mower-deck post (Figure 94).

   Note: For 2500 Series mower decks, use a ratchet in the square hole in the idler arm to remove tension on the idler spring (Figure 95).
6. Remove the belt from the mower-deck pulleys and the clutch pulley.
7. Install the new belt around the mower pulleys and the clutch pulley under the engine (Figure 93 or Figure 95).

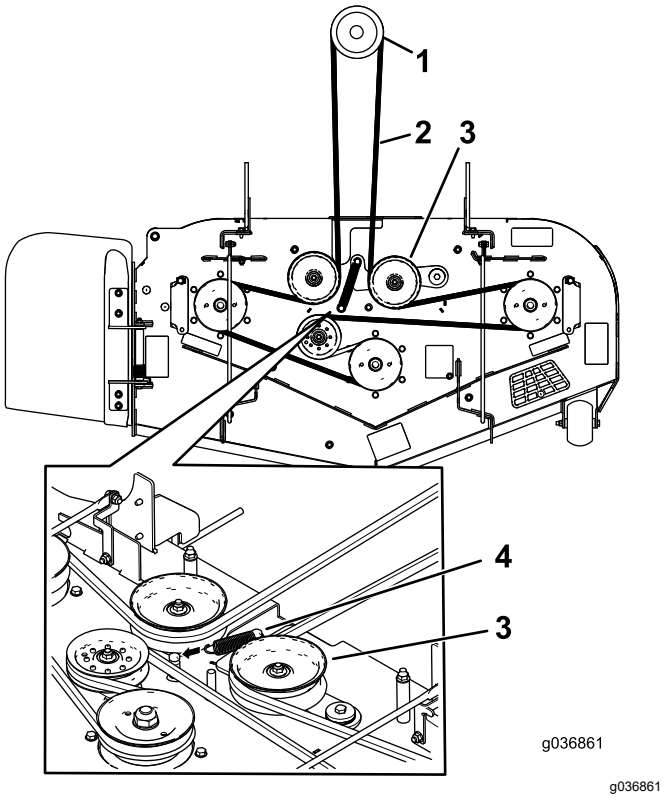


Figure 93
1500 and 2000 Series Mower Decks

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

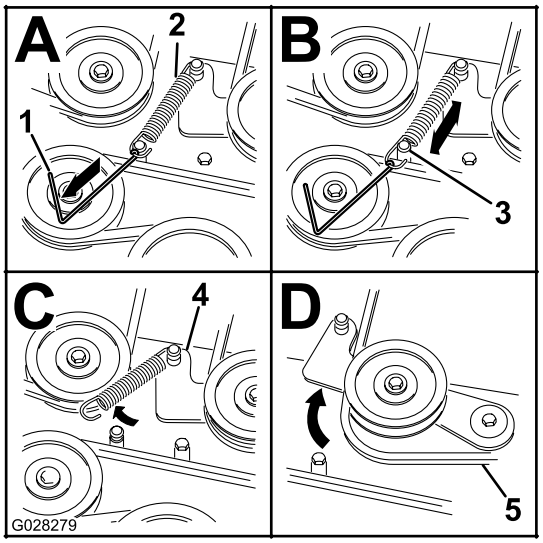


Figure 94
1500 and 2000 Series Mower Decks

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

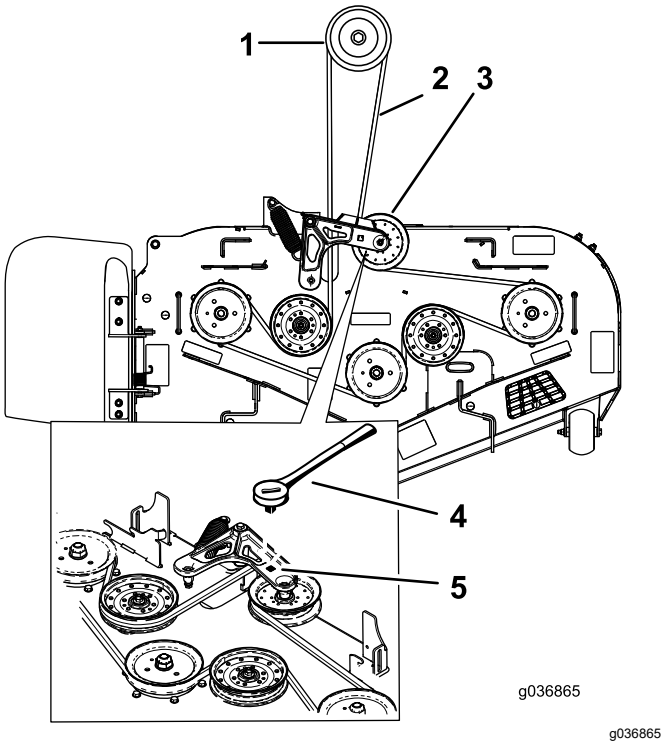


Figure 95
2500 Series Mower Decks

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

8. Install the idler spring (Figure 93 or Figure 95).

   Note: Seat the spring ends in the anchor grooves.

9. Install the belt covers (Figure 96).

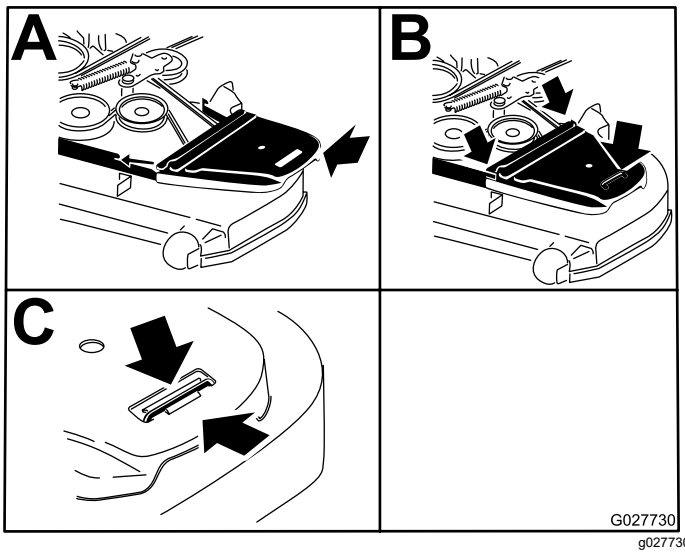


Figure 96

Replacing the Mower Belt for Rear-Discharge Mower Decks

Replacing the Counter-Rotating Belt

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Lower the mower to the 76 mm (3 inches) height of cut.
4. Lift the floor pan up to gain access to the center pulley.
5. Remove the plastic belt cover (Figure 98).
6. Remove the 3 bolts holding the metal belt cover in place and remove the metal belt cover.

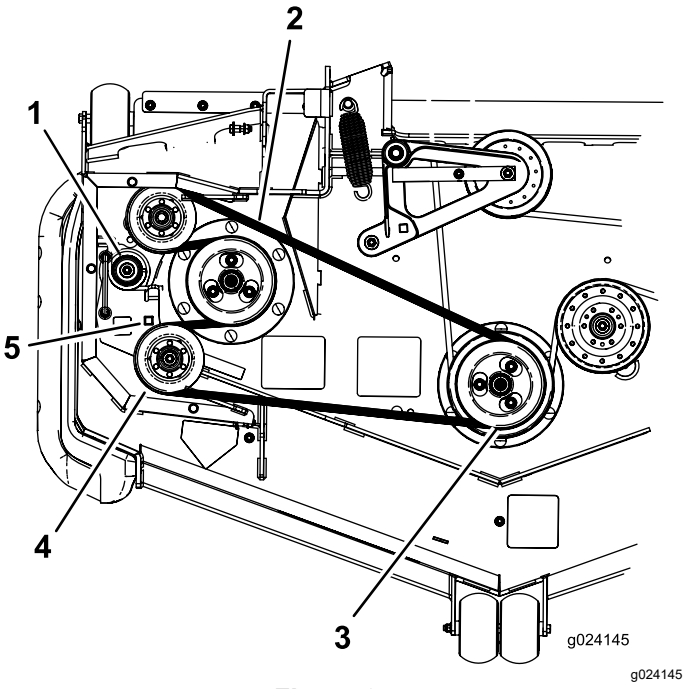


Figure 97

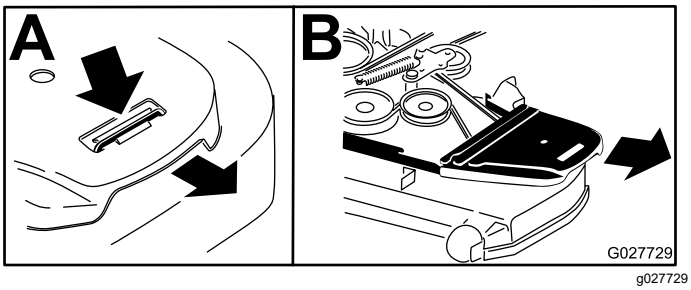
1. Idler spring
2. Counter-rotating belt
3. Double pulley
4. Idler pulley
5. Square hole in the idler arm for the ratchet

7. Use a ratchet in the square hole in the idler arm to remove tension on the idler spring (Figure 97).
8. Remove the belt from the mower deck pulley (Figure 97).

9. Remove the belt from the remaining pulleys (Figure 97).
10. Route the new belt abound the mower pulleys.
11. Using the ratchet in the square hole, remove the tension on the spring, and guide the new belt around the idler pulley (Figure 97).

Replacing the Mower Belt

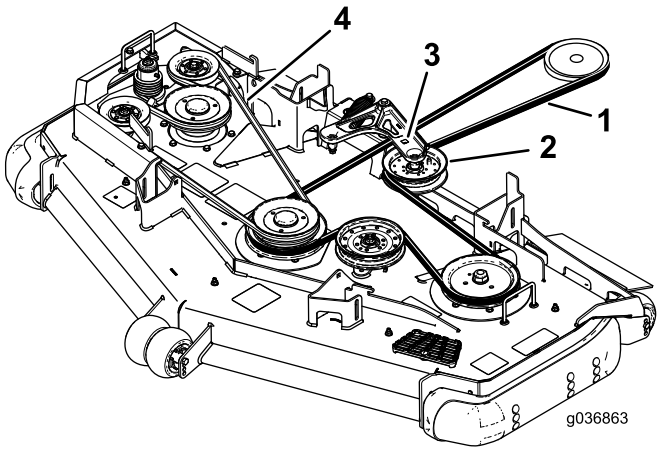
1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Lower the mower to the 76 mm (3 inches) height of cut.
4. Remove the belt covers (Figure 98).



g027729

Figure 98

5. Remove the counter-rotating belt; refer to Replacing the Counter-Rotating Belt (page 67).
6. Use a ratchet in the square hole in the idler arm to remove tension on the idler spring (Figure 99).
7. Remove the belt from the mower-deck pulleys and the clutch pulley.
8. Install the new belt around the mower pulleys and the clutch pulley under the engine (Figure 99).

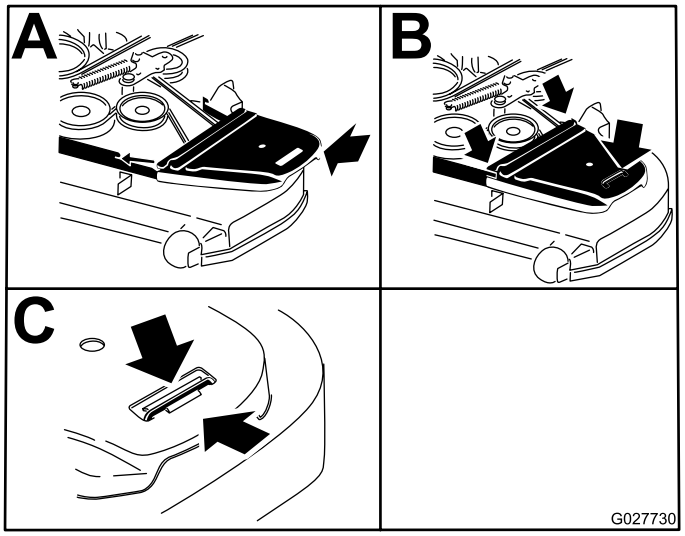


g036863

Figure 99

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

9. Rotate and ensure the belt-guide tab hits against the pivot hub (Figure 99).
10. Using the ratchet in the square hole, install the belt around the spring-loaded idler pulley (Figure 99). Seat the spring ends in the anchor grooves.
11. Install the counter-rotating belt; refer to Replacing the Counter-Rotating Belt (page 67).
12. Install the belt covers (Figure 100).



g027730

Figure 100

Replacing the Hydraulic Pump-Drive Belt

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Remove the mower belt; refer to Replacing the Mower Belt for Side-Discharge Mower Decks (page 66) or Replacing the Mower Belt for Rear-Discharge Mower Decks (page 67).
4. Raise the machine and support it with jack stands (Figure 102).
5. Remove the clutch stop (Figure 101).

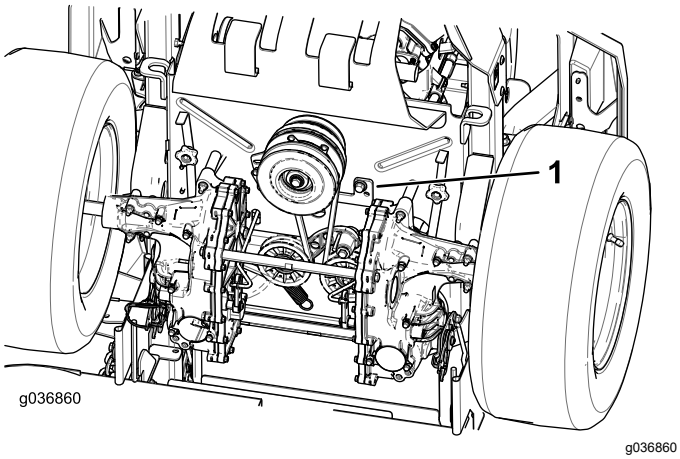


Figure 101

1. Clutch stop

6. Remove the idler spring from the post (Figure 102).
7. Remove the existing belt from the hydraulic-pump-drive pulleys and the engine pulley.
8. Install the new belt around the engine pulley and the 2 hydraulic-pump pulleys (Figure 102).

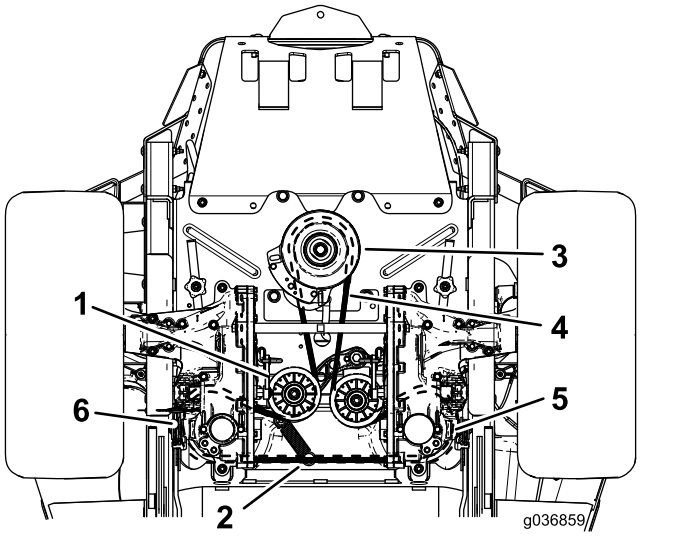


Figure 102

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

9. Install the clutch stop (Figure 101).
10. Install the mower belt; refer to Belt Maintenance (page 66).

Controls System Maintenance

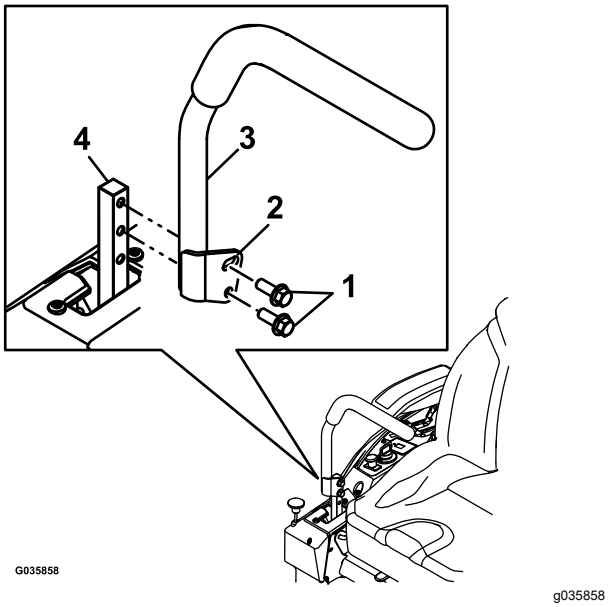
Adjusting the Control-Handle Position

If the ends of the levers hit against each other, refer to Adjusting the Motion-Control Linkage (page 71).

Adjusting the Height

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

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. Remove the hardware holding the control lever to the control-arm shaft.



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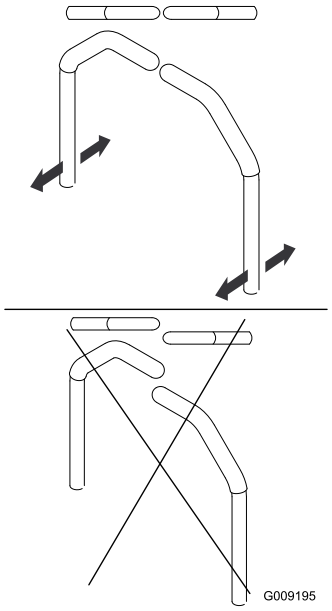
Figure 103

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

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

Adjusting the Tilt

1. 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. Loosen the upper bolt holding the control lever to the control arm shaft.
4. Loosen the lower bolt just enough to pivot the control lever fore or aft. Tighten both bolts to secure the control in the new position.
5. Repeat the adjustment for the opposite control lever.



g009195

Figure 104

Adjusting the Motion-Control Linkage

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

⚠ WARNING

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

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

1. 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. Push the deck-lift pedal and remove the height-of-cut pin. Lower the deck to the ground.
4. Raise the rear of the machine up and support it with jack stands (or equivalent support) just high enough to allow the drive wheels to turn freely.
5. Remove the electrical connection from the seat safety switch, located under the bottom cushion of the seat.

   Note: The switch is a part of the seat assembly.
6. **Temporarily** install a jumper wire across the terminals in the connector of the main harness.
7. Start the engine, run it at full throttle, and disengage the parking brake.

   Note: Before starting the engine, ensure that the parking brake is engaged and that the motion-control levers are out. You do not have to be in the seat.
8. Run the machine at least 5 minutes with the drive levers in the full forward speed to bring the hydraulic fluid up to operating temperature.

   Note: The motion-control levers must be in neutral while you are making any adjustments.
9. Bring the motion-control levers into the NEUTRAL position.
10. Check and ensure that the control-plate tabs touch the return-to-neutral plates on the hydraulic units.
11. Adjust the pump-control-rod lengths by turning the nut in the appropriate direction until the wheels slightly creep in reverse (see Figure 105).
12. Move the motion-control levers to the REVERSE position and while applying slight pressure to the lever, allow the reverse indicator springs to bring the levers back to neutral.

    Note: The wheels should stop turning or slightly creep in reverse.

    Note: You may need to remove the motion-control cover to gain access.

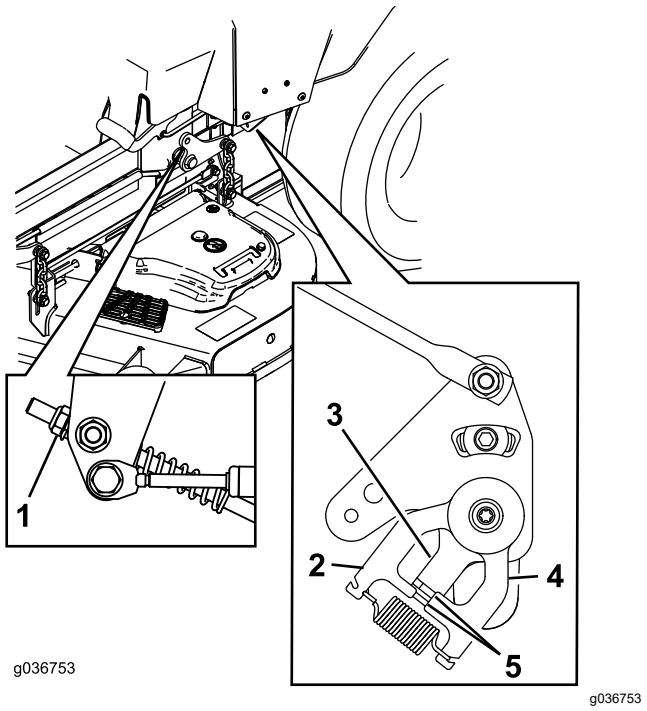


Figure 105

1. Nut
2. Stationary plate
3. Control plate
4. Return-to-neutral plate
5. Tabs touching return to neutral plate

13. Shut off the machine.
14. Remove the jumper wire from the wire harness and plug the connector into the seat switch.
15. Remove the jack stands.
16. Raise the mower deck and install the height-of-cut pin.
17. Check and ensure that the machine does not creep in neutral with the parking brake disengaged.

Hydraulic System Maintenance

Hydraulic System Safety

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

Servicing the Hydraulic System

Hydraulic Fluid Specifications

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

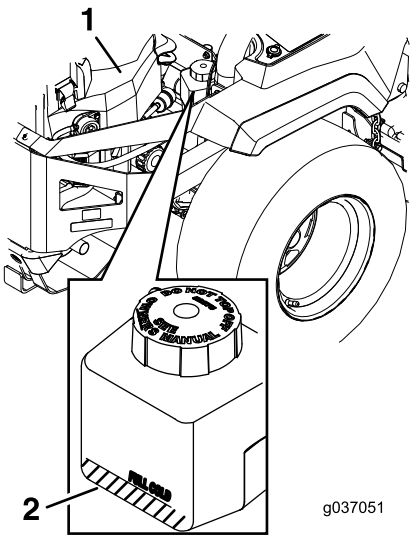
Important: **Use the fluid specified. Other fluids could cause system damage.**

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

Checking the Hydraulic Fluid Level

Service Interval: Before each use or daily

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



g037051

Figure 106

1. Engine
2. Expansion tank

Changing the Hydraulic-System Filters and Fluid

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

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

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

Change the filters and fluid at the same time. **Do not** use the fluid again. Purge any air in the system after you install the new filters and add fluid. Refer to Bleeding the Hydraulic System (page 74).

Repeat the bleeding process until the fluid remains at the FULL COLD line in the reservoir after purging. **Failure to properly perform this procedure can result in irreparable damage to the transaxle drive system.**

Removing the Hydraulic-System Filters

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

4. Locate the filter and guards on each transaxle-drive system (Figure 107).
5. Remove the 3 screws securing the filter guard and guard (Figure 107).

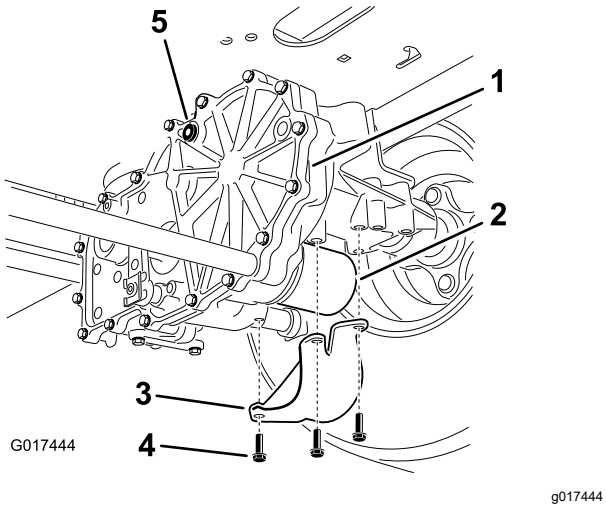


Figure 107
Right side shown

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

6. Carefully clean the area around the filters.

   Important: **Do not allow dirt to enter the hydraulic system, or contamination may occur.**
7. Place a drain pan below the filter to catch the fluid that drains when the filter and vent plugs are removed.
8. Locate and remove the vent plug on each transmission.
9. Unscrew the filter to remove it, and allow the fluid to drain from the drive system.
10. Repeat this procedure for both filters.

Installing the Hydraulic-System Filters

1. Apply a thin coat of hydraulic fluid on the surface of the rubber seal of each filter.
2. Turn the filter clockwise until the rubber seal contacts the filter adapter, then tighten the filter an additional 3/4 to 1 full turn.
3. Repeat for the opposite filter.
4. Install the filter guards over each filter that you previously removed.
5. Use the 3 screws to secure the filter guards.
6. Verify that the vent plugs are removed before adding the fluid.
7. Slowly pour the specified fluid through the expansion reservoir until fluid comes out of 1 of the vent-plug holes.
8. Install the vent plug.
9. Torque the plug to 20 N·m (15 ft-lb).
10. Continue to add fluid through the expansion reservoir until fluid comes out of the remaining vent-plug hole on the second transmission.
11. Install the opposite vent plug.
12. Torque the plug to 20 N·m (15 ft-lb).
13. Continue to add fluid through the expansion reservoir until it reaches the FULL COLD line on the expansion reservoir.
14. Proceed to Bleeding the Hydraulic System (page 74).

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

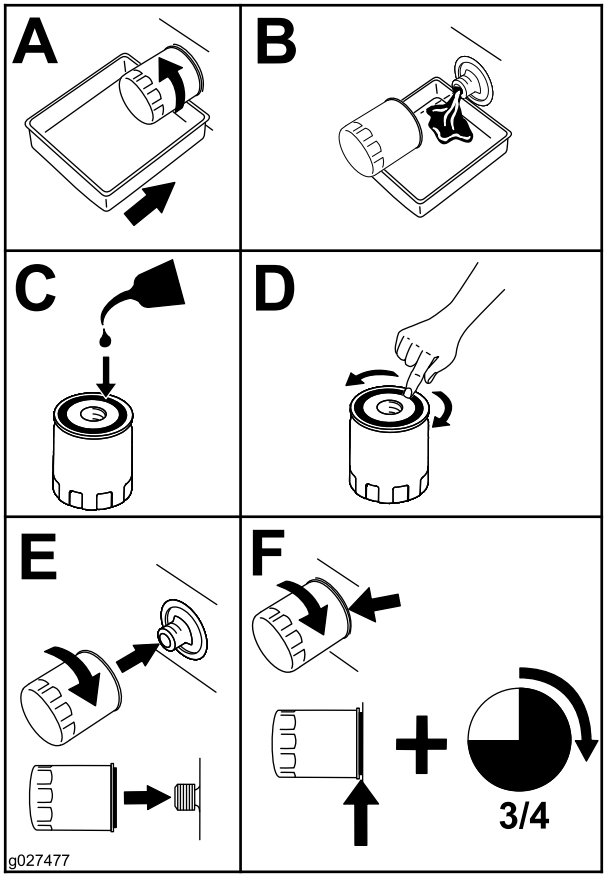


Figure 108

Bleeding the Hydraulic System

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

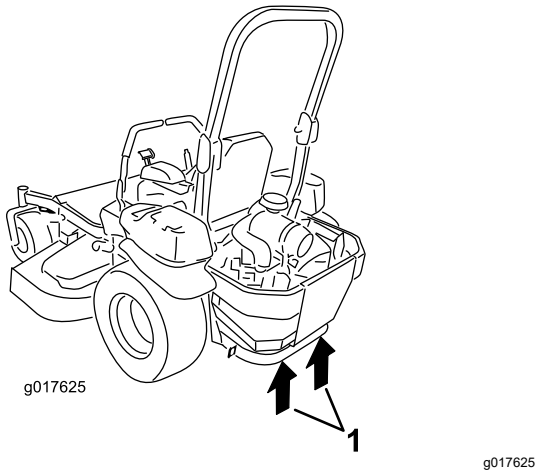


Figure 109

1. Jacking points

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

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

Mower Deck Maintenance

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 (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and disconnect the spark-plug wires from the spark plugs.

Inspecting the Blades

Service Interval: Before each use or daily

1. Inspect the cutting edges (Figure 110).
2. If the edges are not sharp or have nicks, remove and sharpen the blade; refer to Sharpening the Blades (page 77).
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 110).

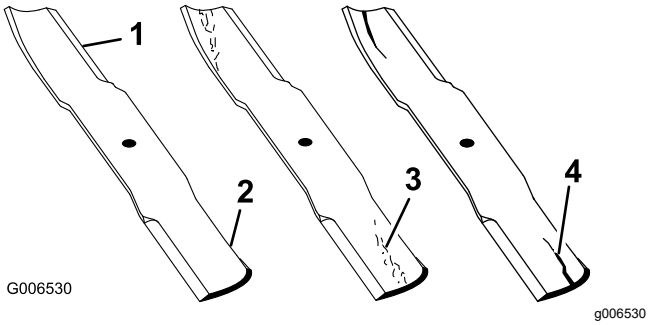


Figure 110

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

Checking for Bent Blades

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

1. Raise the mower deck to the highest height-of-cut position.
2. While wearing thickly padded gloves, or other adequate hand protection, slowly rotate the blade into a position that allows you to measure the distance between the cutting edge and the level surface the machine is on (Figure 111).

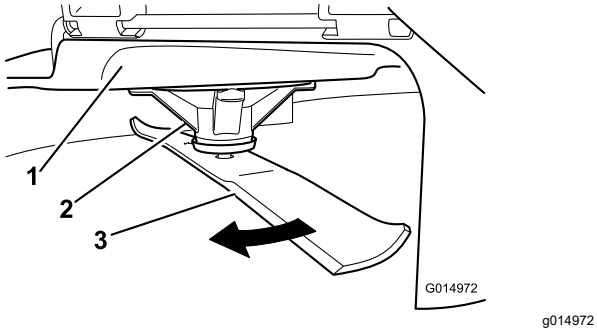


Figure 111

1. Deck
2. Spindle housing
3. Blade

3. Measure from the tip of the blade to the flat surface (Figure 112).

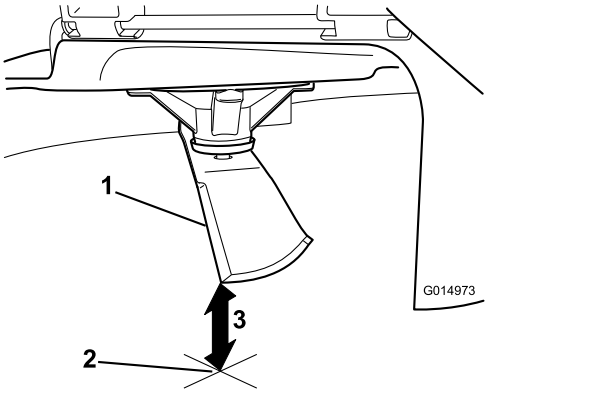


Figure 112

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

4. Rotate the same blade 180 degrees so that the opposing cutting edge is now in the same position (Figure 113).

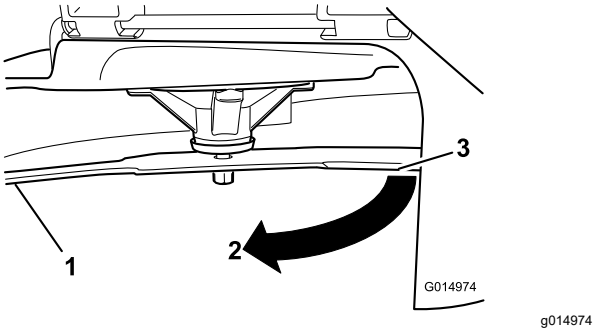


Figure 113

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

5. Measure from the tip of the blade to the flat surface (Figure 114).

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

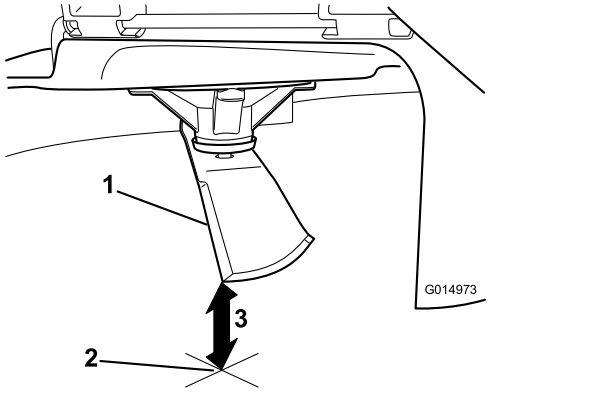


Figure 114

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

A. If the difference between A and B is greater than 3 mm (1/8 inch), replace the blade with a new blade; refer to Replacing the Blades for Side Discharge Mower Decks (page 76) or Replacing the Blades for Rear Discharge Mower Decks (page 76).

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

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

6. Repeat this procedure on each blade.

Replacing the Blades for Side Discharge Mower Decks

Removing the Blades for Side-Discharge Mower Deck

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

1. Hold the spindle shaft with a wrench.
2. Remove the blade bolt, curved washer, and blade from the spindle shaft (Figure 115).

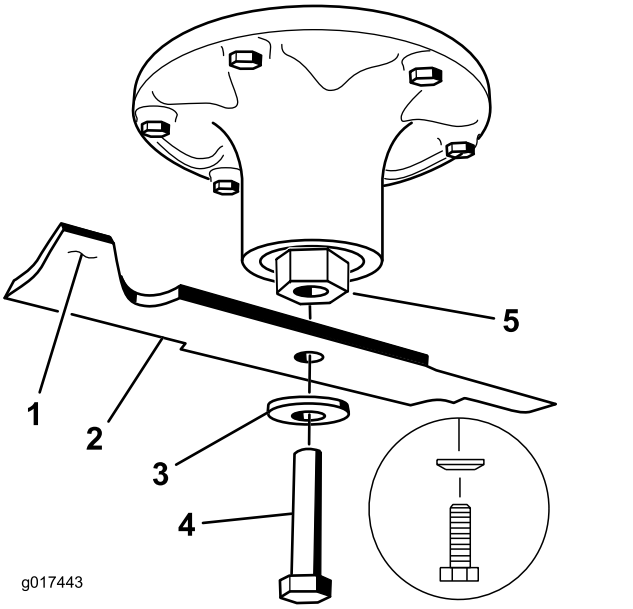


Figure 115

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

Installing the Blades for Side Discharge Mower Decks

1. Install the blade onto the spindle shaft (Figure 115).

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

2. Install the curved washer and blade bolt (Figure 115).

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

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

Replacing the Blades for Rear Discharge Mower Decks

Removing the Blades for Rear Discharge Mower Decks

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

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 116).

3. Remove the right blade bolt (left-hand threaded bolt), curved washer, and blade from the spindle shaft (Figure 117).

   Note: Note the blade type and where each blade is installed. See Figure 117 for the correct position.

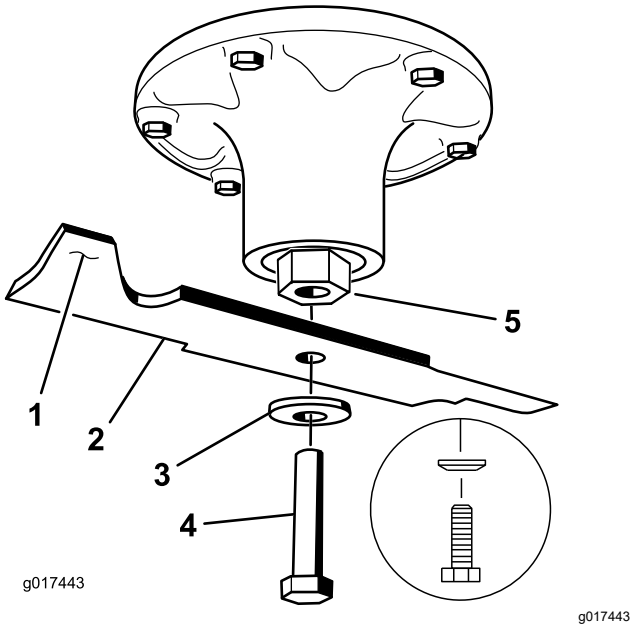


Figure 116
Left and Center Spindle Shown

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

Installing the Blades for Rear Discharge Mower Decks

Important: **The right blade on this mower deck is counter-rotating and uses a left-hand threaded blade bolt. Use Figure 117 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 116 and Figure 117).

   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 116).

2. Install the right blade, curved washer, and blade bolt (left-hand threaded bolt) to the spindle shaft (Figure 116 and Figure 117).
3. Torque the blade bolts to 115 to 150 N·m (85 to 110 ft-lb); refer to Figure 117.

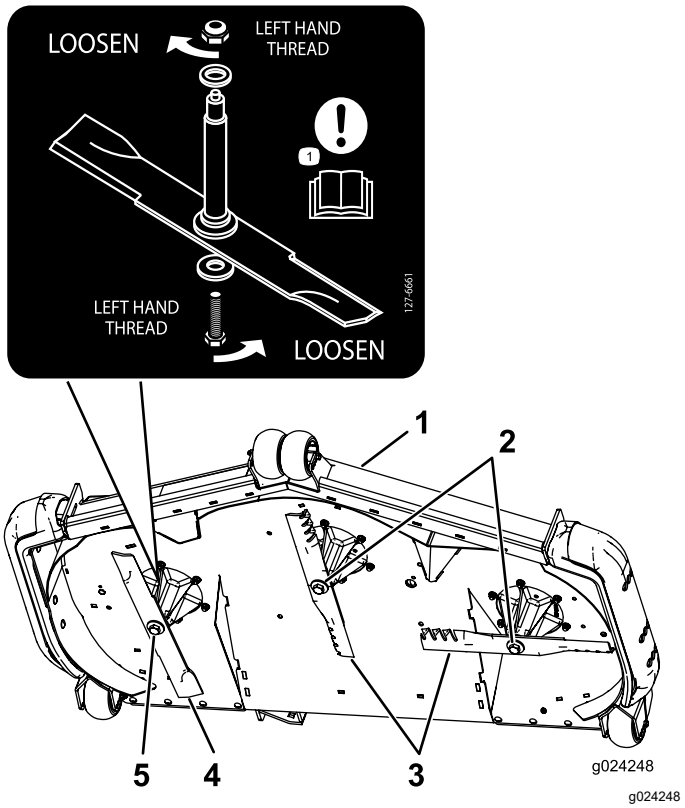


Figure 117

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 118).

   Note: Maintain the original angle.

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

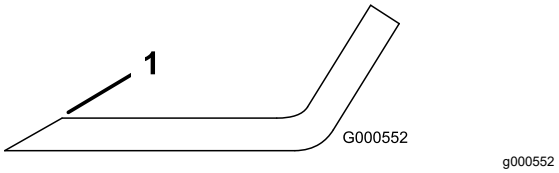


Figure 118

1. Sharpen at original angle.

2. Check the balance of the blade by putting it on a blade balancer (Figure 119).

   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 118).

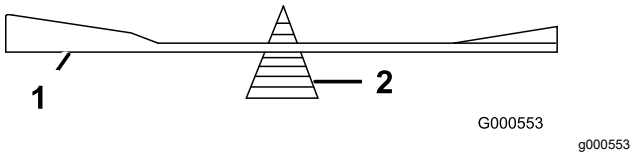


Figure 119

1. Blade
2. Balancer

3. Repeat this procedure until the blade is balanced.

Leveling the Mower Deck

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

Check the mower deck for bent blades prior to leveling, and remove and replace any bent blades; refer to the Servicing the Cutting Blades (page 74) before continuing.

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

Requirements:

- The machine must be on a level surface.
- All tires must be properly inflated; refer to Checking the Tire Pressure (page 63).

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

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Check the tire pressure in the drive tires. Refer to Checking the Tire Pressure (page 63).
4. Position the mower deck in the transport-lock position.
5. Carefully rotate the blades from side to side.
6. Measure between the blade tip and the flat surface (Figure 120). If the measurements are not within 5 mm (3/16 inch), adjust the leveling; continue with this procedure.

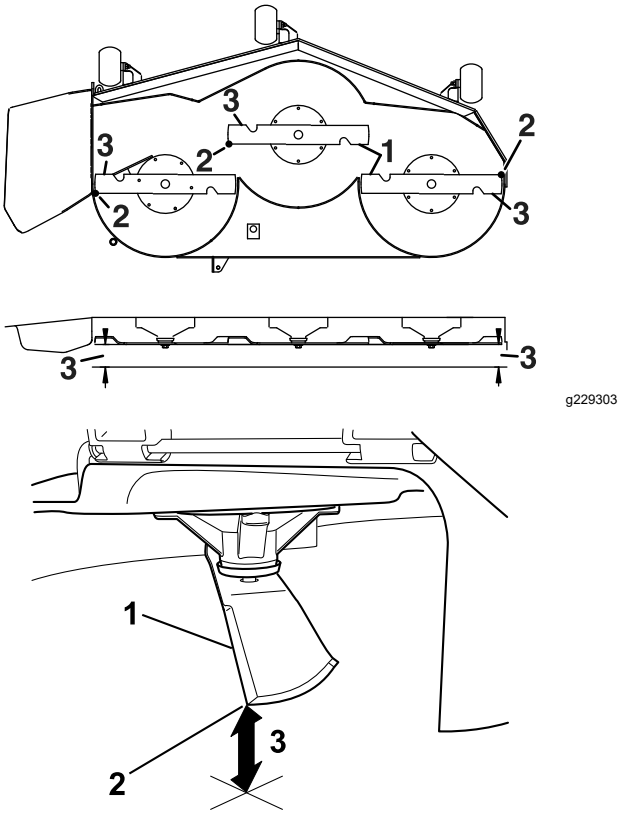


Figure 120

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

7. Check the front-to-rear blade level (Figure 121). Ensure the front blade tip is lower than the rear blade tip as shown in the block height and rake table. If it needs adjustment, continue with this procedure.

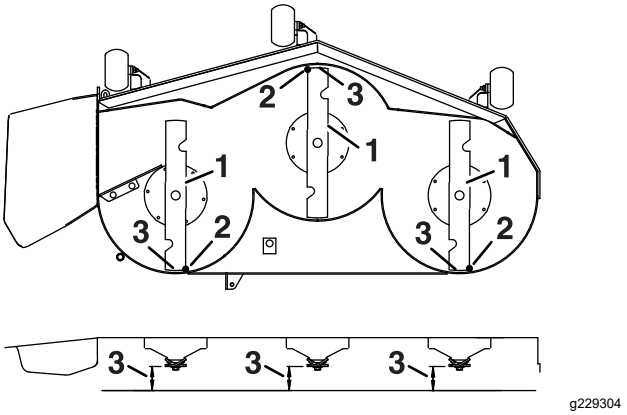


Figure 121

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

8. Set the anti-scalp rollers to top holes or remove them completely for this adjustment.
9. Place 2 blocks (see table below) under the rear edge of the cutting deck skirt; 1 on each side of the cutting deck (Figure 122).
10. Set the height-of-cut lever to the 3 inch (76 mm) position.
11. Place 2 blocks under each side of the front edge of the deck, but not under the anti-scalp roller brackets or welds.

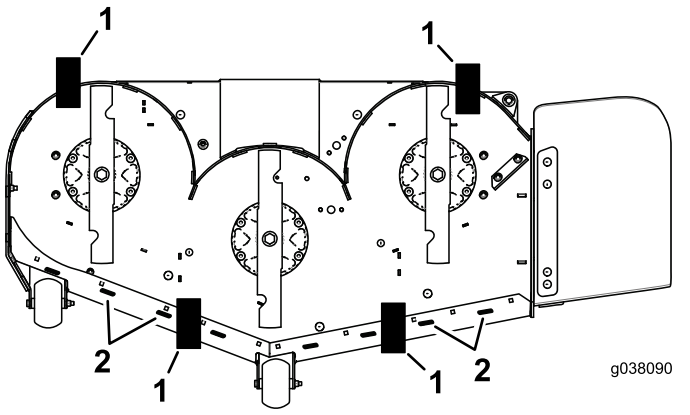


Figure 122
Bottom view

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

Block Height and Rake Table

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

12. Carefully rotate the blades side to side (Figure 120).
13. Loosen the locknuts (Figure 123) on all 4 corners and ensure that the mower deck is sitting securely on all 4 blocks.
14. Remove any slack from the deck hangers and make sure the deck-lift foot lever is pushed back against the stop.
15. Tighten the 4 locknuts.

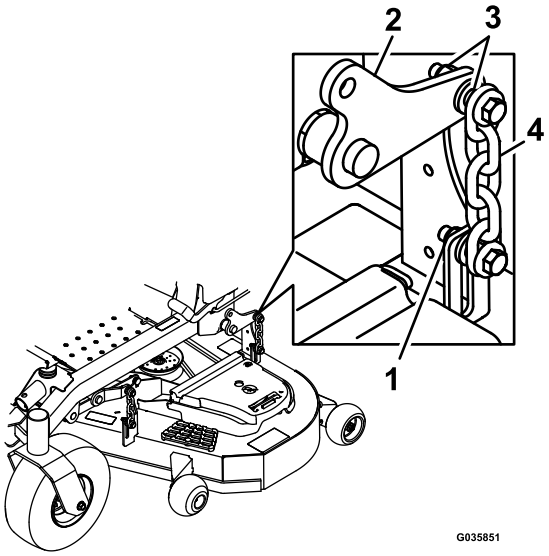


Figure 123

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

16. Ensure that the blocks fit snugly under the deck skirt and that all attachment bolts are tight
17. Continue leveling the deck by checking the front-to-rear blade slope.
18. Check the blades for levelness and repeat deck leveling procedure if necessary.

Removing the Mower Deck

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Lower the height-of-cut lever to the lowest position.
4. Remove the hairpin cotter from the front support rod, and remove the rod from the deck bracket (Figure 124).

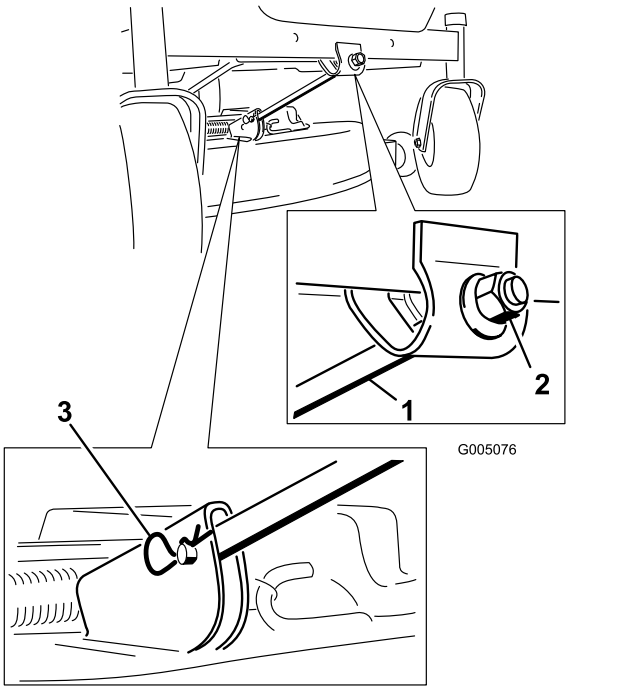


Figure 124

1. Front support rod
2. Locking nut
3. Deck bracket

5. Carefully lower the front of the mower deck to the ground.
6. Lift the mower deck and hanger brackets clear of the rear lift rod and lower the mower carefully to the ground (Figure 125).

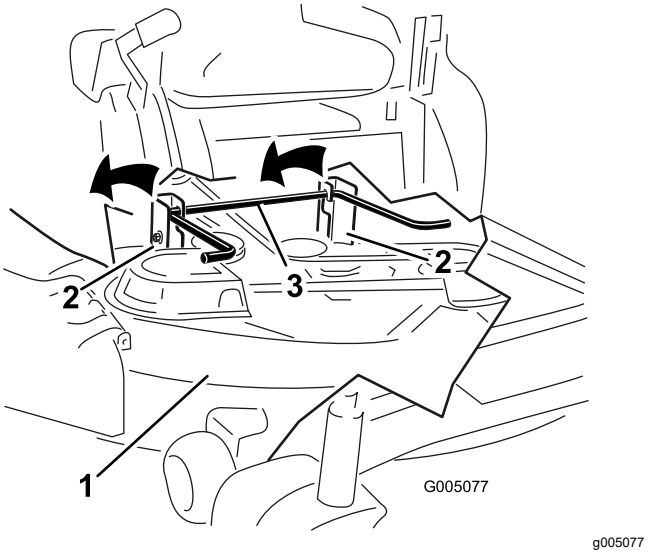


Figure 125

1. Mower deck
2. Hanger bracket
3. Rear lift rod

7. Slide the mower deck rearward to remove the mower belt from the engine pulley.
8. Slide the mower deck out from underneath the machine.

   Note: Retain all parts for future installation.

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 mulch plate, discharge deflector, or grass collection system.

1. Remove the locknut, bolt, spring, and spacer holding the deflector to the pivot brackets (Figure 126).
2. Remove the damaged or worn grass deflector (Figure 126).

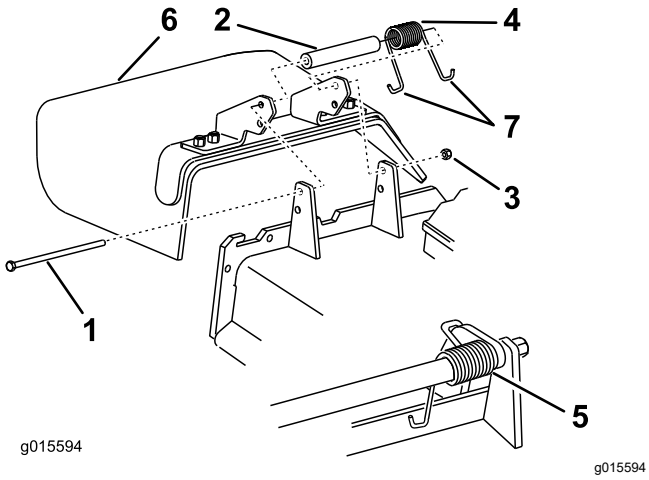


Figure 126

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

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

   Note: Make sure that 1 J-hook end of the spring is installed behind the deck edge before installing the bolt as shown in Figure 126.
5. Install the bolt and the nut.
6. Place 1 J-hook end of the spring around the grass deflector (Figure 126).

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

Cleaning

Cleaning under the Mower Deck

Service Interval: Before each use or daily

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

Cleaning the Suspension System

Service Interval: Before each use or daily

Use compressed air to clean the suspension system.

Note: Do not clean the shock assemblies with pressurized water (Figure 127).

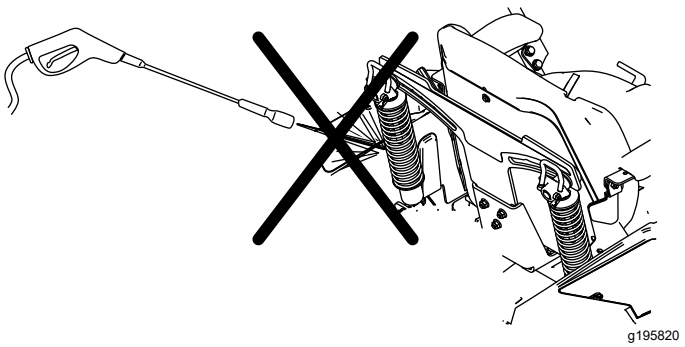


Figure 127

Disposing of Waste

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

Storage

Storage Safety

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

Cleaning and Storage

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

   Important: **You can wash the machine with mild detergent and water. Do not pressure wash the machine. Avoid excessive use of water, especially near the control panel, engine, hydraulic pumps, and motors.**
4. Check the parking brake operation; refer to Adjusting the Parking Brake (page 64).
5. Service the air cleaner; refer to Engine Maintenance (page 42).
6. Grease the machine; refer to Lubrication (page 40).
7. Change the crankcase oil; refer to Engine Maintenance (page 42).
8. Check the tire pressure; refer to Checking the Tire Pressure (page 63).
9. Change the hydraulic filters; refer to Changing the Hydraulic-System Filters and Fluid (page 72).
10. Charge the battery; refer to Charging the Battery (page 60).
11. Scrape any heavy buildup of grass and dirt from the underside of the mower, then wash the mower with a garden hose.

    Note: Run the machine with the blade-control switch (PTO) engaged and the engine at high idle for 2 to 5 minutes after washing.
12. Check the condition of the blades; refer to Servicing the Cutting Blades (page 74).
13. Prepare the machine for storage when non-use occurs over 30 days. Prepare the machine for storage as follows:

    A. Add a petroleum-based stabilizer/conditioner to fuel in the tank. Follow mixing instructions from the stabilizer manufacturer. Do not use an alcohol-based stabilizer (ethanol or methanol).

    Note: A fuel stabilizer/conditioner is most effective when mixed with fresh fuel and used at all times.

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

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

    D. Start the engine and run it until it stops.

    E. Dispose of fuel properly. Recycle the fuel according to local codes.

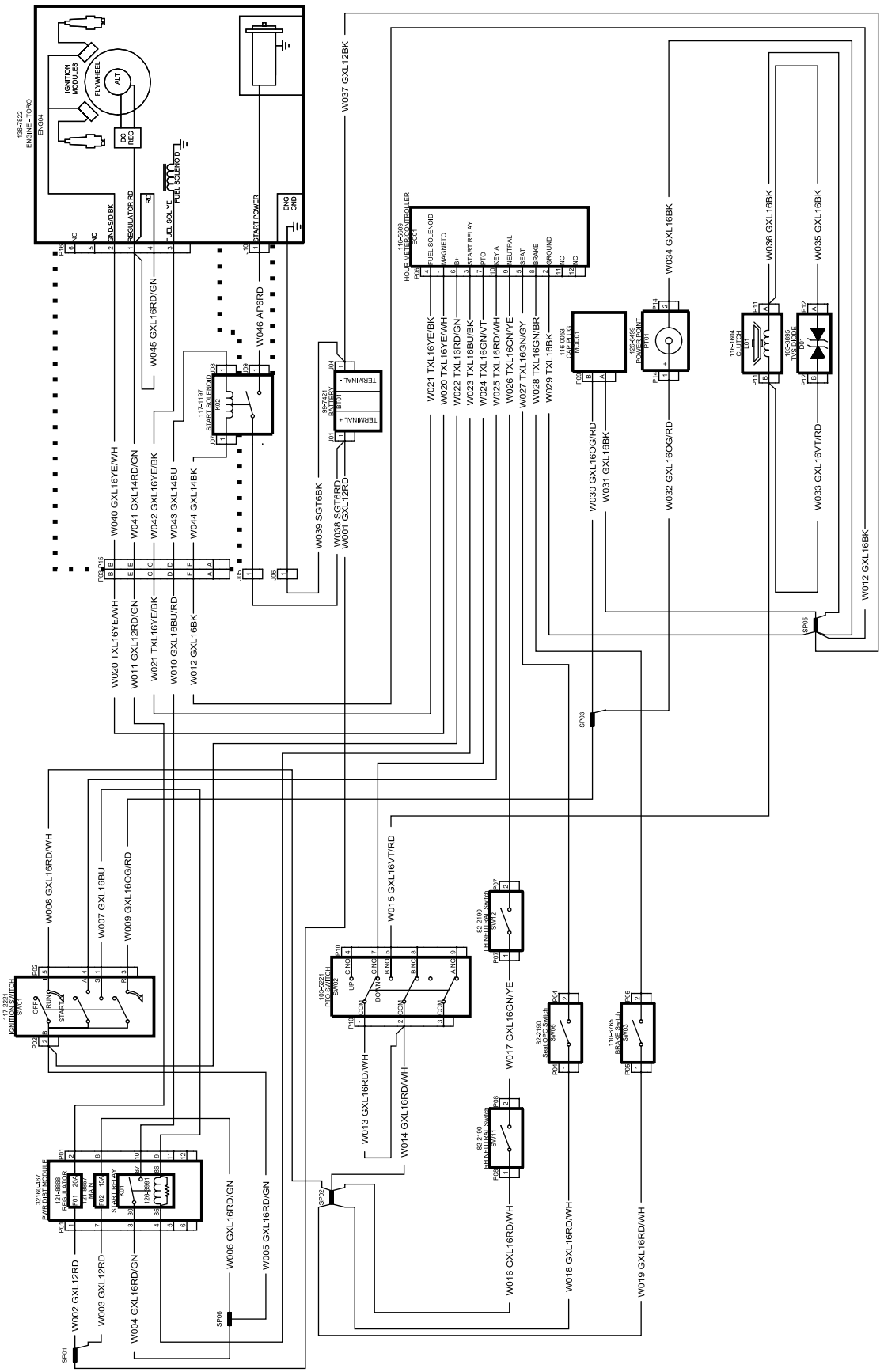
    Important: **Do not store fuel containing stabilizer/conditioner longer than the duration recommended by the fuel-stabilizer manufacturer.**
14. Remove and check the condition of the spark plug(s); refer to Engine Maintenance (page 42). With the spark plug(s) removed from the engine, pour 30 ml (2 tablespoons) of engine oil into the spark plug hole. Use the starter to crank the engine and distribute the oil inside the cylinder. Install the spark plug(s). Do not install the wire on the spark plug(s).
15. Check and tighten all bolts, nuts, and screws. Repair or replace any part that is damaged.
16. Paint all scratched or bare metal surfaces. Paint is available from your Authorized Service Dealer.
17. Store the machine in a clean, dry garage or storage area. Remove the key from the switch and keep it out of reach of children or other unauthorized users. Cover the machine to protect it and keep it clean.

Troubleshooting

Problem	Possible Cause	Corrective Action
The engine overheats.	1. The engine load is excessive. 2. The oil level in the crankcase is low. 3. The cooling fins and air passages under the engine-blower housing are plugged. 4. The air cleaner is dirty. 5. Dirt, water, or stale fuel is in the fuel system.	1. Reduce the ground speed. 2. Add oil to the crankcase. 3. Remove the obstruction from the cooling fins and air passages. 4. Clean or replace the air-cleaner element. 5. Contact an Authorized Service Dealer
The starter does not crank.	1. The blade-control switch is engaged. 2. The motion-control levers are not in the NEUTRAL-LOCK position. 3. The battery is dead. 4. The electrical connections are corroded or loose. 5. A fuse is blown. 6. A relay or switch is damaged.	1. Disengage the blade-control switch. 2. Move the motion-control levers outward to the NEUTRAL-LOCK position. 3. Charge the battery. 4. Check the electrical connections for good contact. 5. Replace the fuse. 6. 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 fuel-shutoff valve is closed. 3. The oil level in the crankcase is low. 4. The throttle is not in the correct position. 5. There is dirt in the fuel filter. 6. Dirt, water, or stale fuel is in fuel system. 7. The air cleaner is dirty. 8. The seat switch is not functioning properly. 9. The electrical connections are corroded, loose, or damaged. 10. The relay or switch is worn or damaged. 11. The spark plug is fouled or improperly gapped. 12. The spark-plug wire is not connected.	1. Fill the fuel tank. 2. Open the fuel-shutoff valve. 3. Add oil to the crankcase. 4. Be sure that the throttle control is midway between the slow and fast positions. 5. Replace the fuel filter. 6. Contact an Authorized Service Dealer. 7. Clean or replace the air-cleaner element. 8. Check the seat-switch indicator. Replace the seat if necessary. 9. Check the electrical connections for good contact. Clean the connector terminals thoroughly with electrical-contact cleaner, apply dielectric grease, and make the appropriate connections. 10. Contact an Authorized Service Dealer. 11. Adjust or replace the spark plug. 12. Check the spark-plug wire connection.
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 the 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 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 the air passages. 5. Clean or replace the fuel cap. 6. Replace the fuel filter. 7. Contact an Authorized Service Dealer.
The mower pulls to the left or right (with levers fully forward)	1. The tracking needs adjustment 2. The tire pressure in the drive tires is not correct.	1. Adjust the tracking. 2. Adjust the tire pressure in the drive tires.

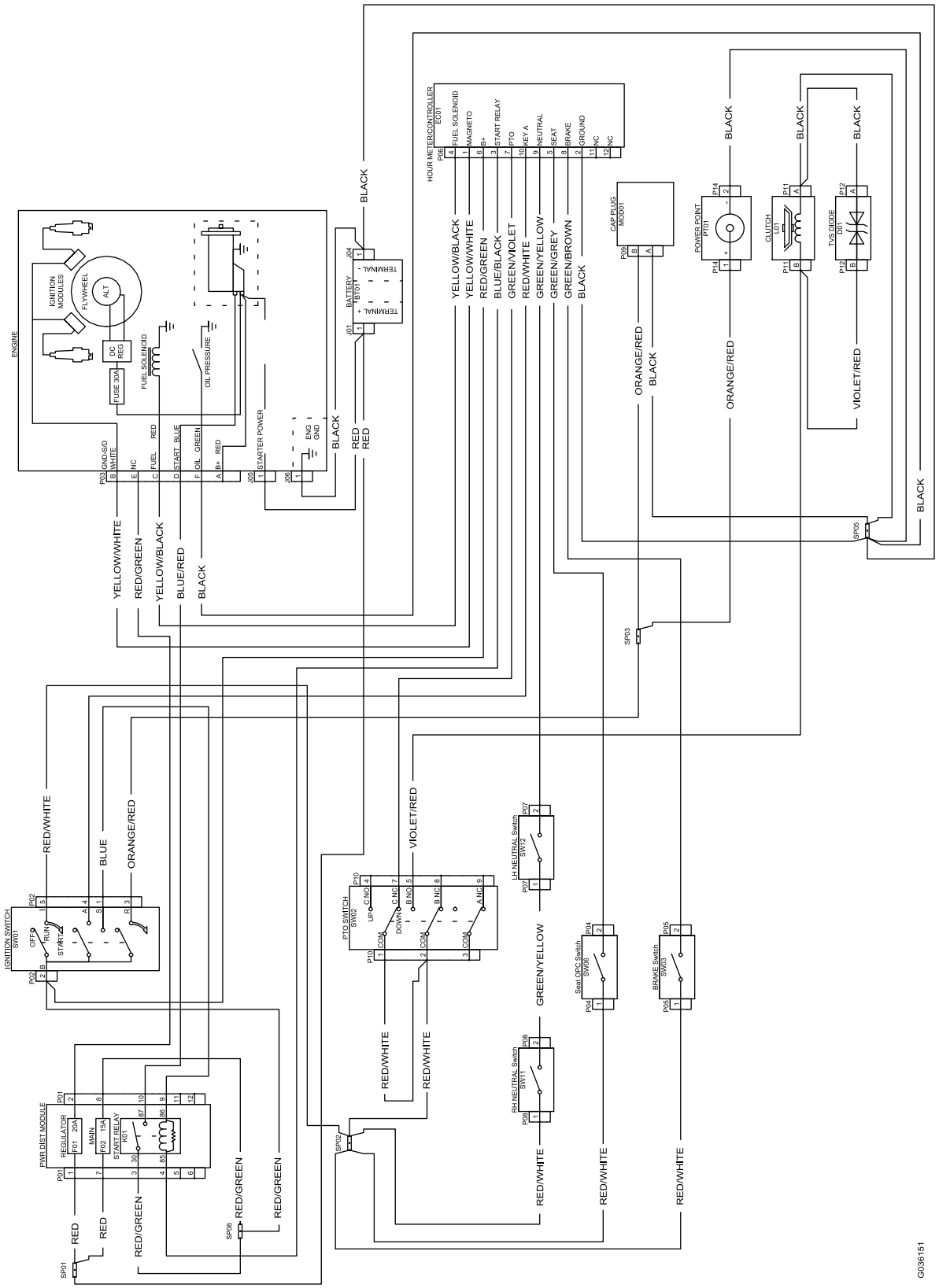
Problem	Possible Cause	Corrective Action
The machine does not drive.	1. The bypass valves are not closed tight. 2. The pump belt is worn, loose, or broken. 3. The pump belt is off a pulley. 4. The idler spring is broken or missing. 5. The hydraulic fluid level is low or too hot.	1. Tighten the bypass valves. 2. Change the belt. 3. Change the belt. 4. Replace the spring. 5. Add hydraulic fluid to the reservoirs or let it cool down.
The machine vibrates abnormally.	1. The cutting blade(s) is/are bent or unbalanced. 2. The blade mounting bolt is loose. 3. The engine mounting bolts are loose. 4. The engine pulley, idler pulley, or blade pulley is loose. 5. The engine pulley is damaged. 6. The blade spindle is bent. 7. The motor mount is loose or worn.	1. Install new cutting blade(s). 2. Tighten the blade mounting bolt. 3. Tighten the engine mounting bolts. 4. Tighten the appropriate pulley. 5. Contact an Authorized Service Dealer. 6. Contact an Authorized Service Dealer. 7. Contact an Authorized Service Dealer.
The cutting height is uneven.	1. The blade(s) is not sharp. 2. A cutting blade(s) is/are bent. 3. The mower is not level. 4. An anti-scalp roller (if applicable) is not set correctly. 5. The underside of the mower deck is dirty. 6. The tire pressure is incorrect. 7. A blade spindle is bent.	1. Sharpen the blade(s). 2. Install a new cutting blade(s). 3. Level the mower from side-to-side and front-to-rear. 4. Adjust the anti-scalp wheel height. 5. Clean the underside of the mower deck. 6. Adjust the tire pressure. 7. Contact an Authorized Service Dealer.
The blades do not rotate.	1. The drive belt is worn, loose or broken. 2. The drive belt is off of the pulley. 3. The power takeoff (PTO) switch or PTO clutch is faulty. 4. The mower belt is worn, loose, or broken.	1. Install a new drive belt. 2. Install the drive belt and check the adjusting shafts and belt guides for the correct position. 3. Contact an Authorized Service Dealer. 4. Install a new mower belt.
The clutch does not engage.	1. The fuse is blown. 2. There is low voltage supply at the clutch. 3. The coil is damaged. 4. There is inadequate current supply. 5. The rotor/armature air gap is too large.	1. Replace the fuse. Check the coil resistance, battery charge, charging system, and wiring connections, and replace components if necessary. 2. Check the coil resistance, battery charge, charging system, and wiring connections and replace parts if necessary. 3. Replace the clutch. 4. Repair or replace the clutch lead wire or electrical system. Clean the connector contacts. 5. Remove the shim or replace the clutch.

Schematics



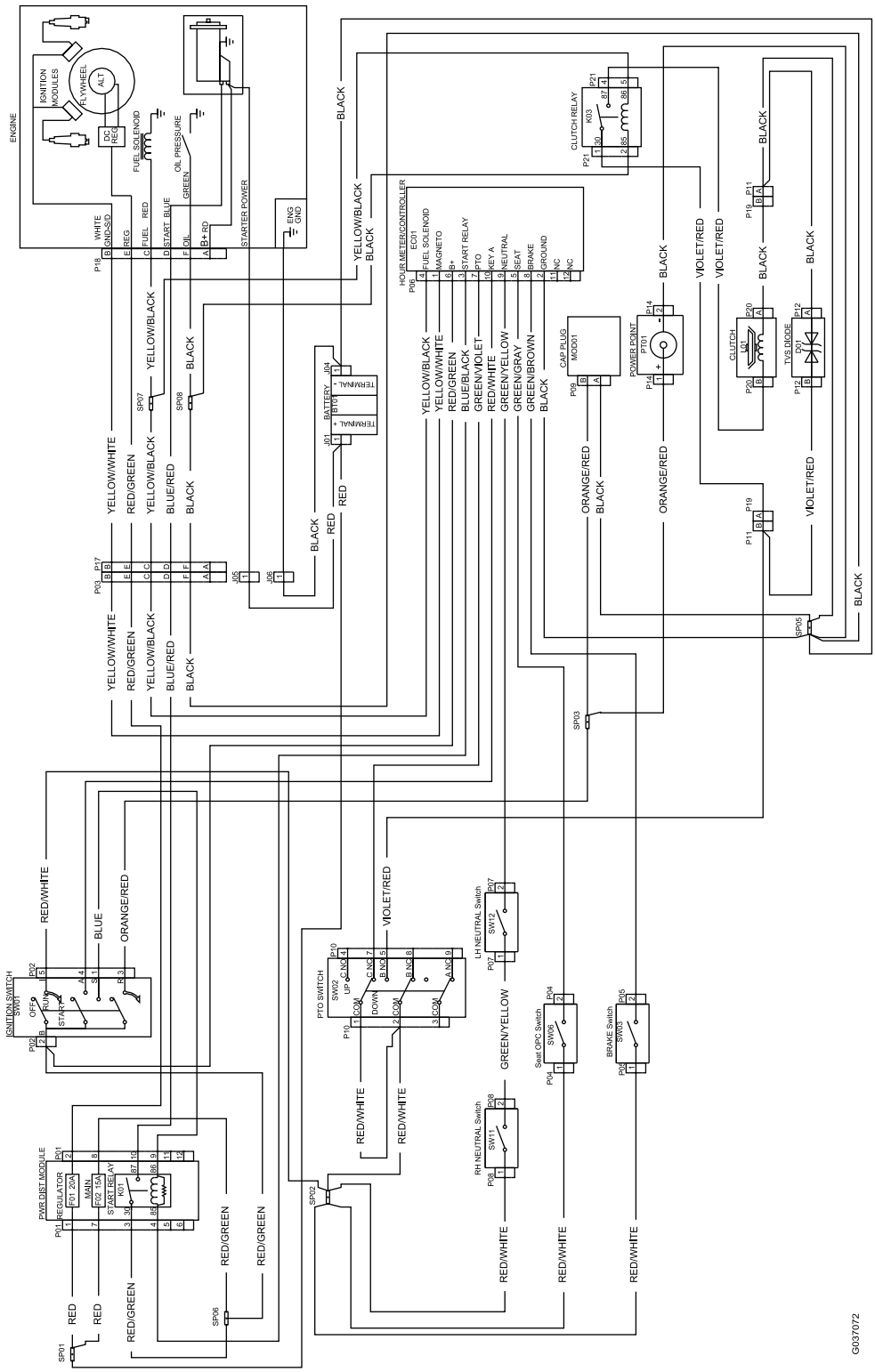
g412076

Wire Diagram—Toro Engines (Rev. B)



g036151

Wire Diagram—Kohler Engines (Rev. A)



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Wire Diagram—Kawasaki Engines (Rev. A)



Count on it.