Form No. 3434-326 Rev G

TORO®

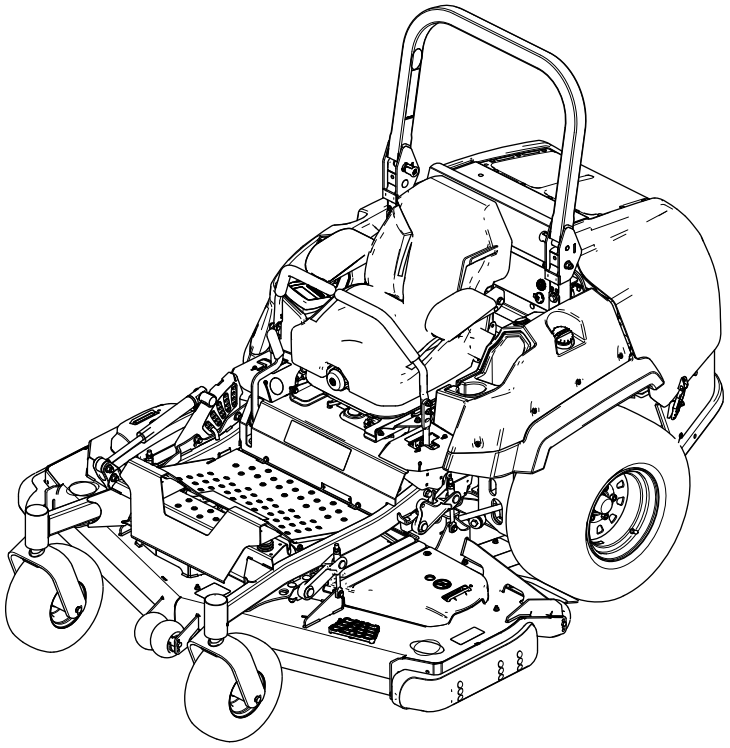
Count on it.

Operator's Manual

Z Master® Professional 7500-D Series Riding Mower

with 60in or 72in TURBO FORCE® Mower

Model No. 72028—Serial No. 400000000 and Up
Model No. 72029—Serial No. 400000000 and Up
Model No. 72074—Serial No. 400000000 and Up
Model No. 72076—Serial No. 400000000 and Up



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

3434-326

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.

The enclosed engine owner's manual is supplied for information regarding the US Environmental Protection Agency (EPA) and the California Emission Control Regulation of emission systems, maintenance, and warranty. Replacements may be ordered through the engine manufacturer.

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

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

Go to www.Toro.com to view specifications on your model.

⚠ WARNING

CALIFORNIA
Proposition 65 Warning

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

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

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

Introduction

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

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

Visit www.Toro.com for product safety and operation training materials, accessory information, help finding a dealer, or to register your product.

Whenever you need service, genuine Toro parts, or additional information, contact an Authorized Service Dealer or Toro Customer Service and have the model and serial numbers of your product ready. Figure 1 identifies the location of the model and serial numbers on the product. Write the numbers in the space provided.

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

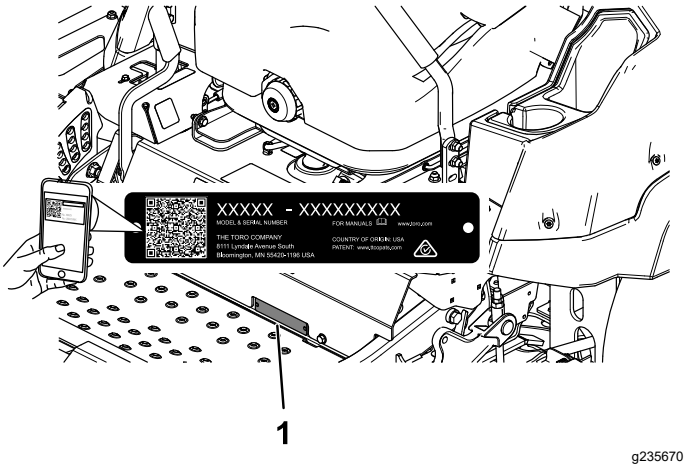


Figure 1

1. Model and serial number location

Model No. _____

Serial No. _____

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

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Bloomington, MN 55420

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Safety

Safety-Alert Symbol

The safety-alert symbol (Figure 2) shown in this manual and on the machine identifies important safety messages that you must follow to prevent accidents.



g000502

Figure 2

Safety-alert symbol

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

DANGER indicates an imminently hazardous situation which, if not avoided, **will** result in death or serious injury.

WARNING indicates a potentially hazardous situation which, if not avoided, **could** result in death or serious injury.

CAUTION indicates a potentially hazardous situation which, if not avoided, **may** result in minor or moderate injury.

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

General Safety

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

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

Slope Indicator

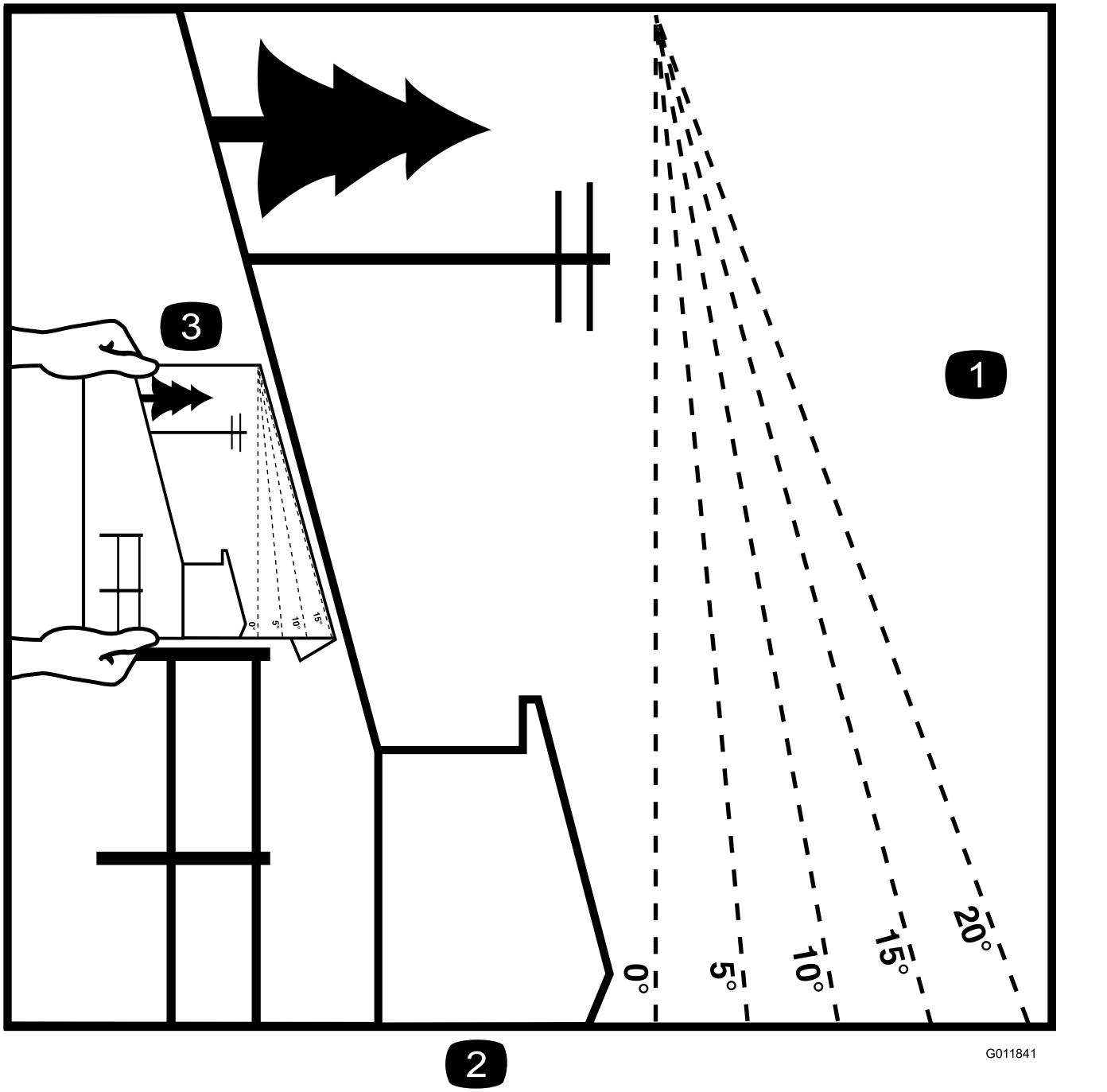


Figure 3

You may copy this page for personal use.

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

Safety and Instructional Decals

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

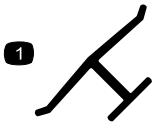


decalbatterysymbols

Battery Symbols

Some or all of these symbols are on your battery.

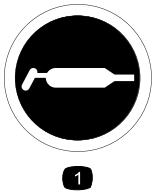
1. Explosion hazard
2. No fire, open flame, or smoking
3. Caustic liquid/chemical burn hazard
4. Wear eye protection.
5. Read the *Operator's Manual*.
6. Keep bystanders away from the battery.
7. Wear eye protection; explosive gases can cause blindness and other injuries.
8. Battery acid can cause blindness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



decaloemmarkt

Manufacturer's Mark

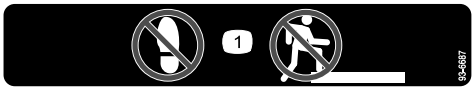
1. Indicates the blade is identified as a part from the original machine manufacturer.



decal58-6520

58-6520

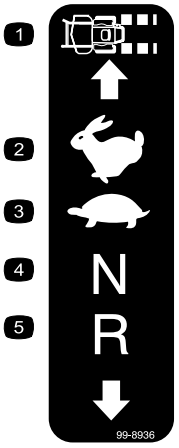
1. Grease



decal93-6687

93-6687

1. Do not step here.



decal99-8936

99-8936

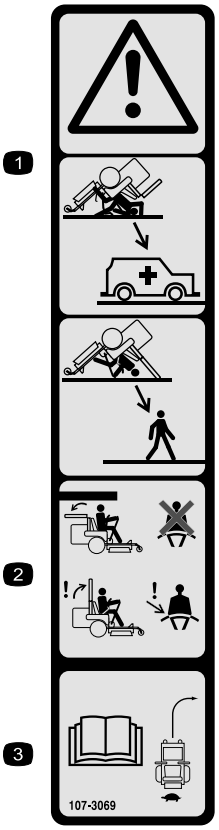
1. Machine speed
2. Fast
3. Slow
4. Neutral
5. Reverse



decal106-5517

106-5517

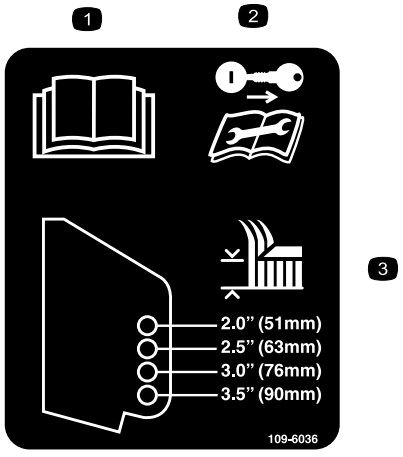
1. Warning—do not touch the hot surface.



decal107-3069

107-3069

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

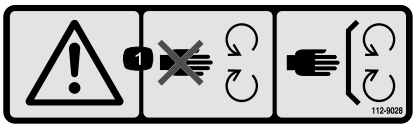


decal109-6036

109-6036

Rear Discharge Machines Only

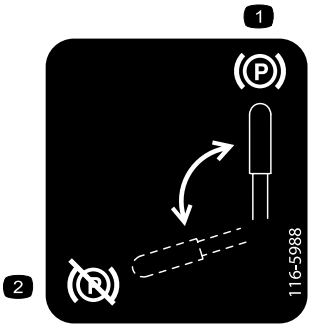
1. Read the *Operator's Manual*.
2. Remove the key and read the instructions before servicing or performing maintenance.
3. Height of cut



decal112-9028

112-9028

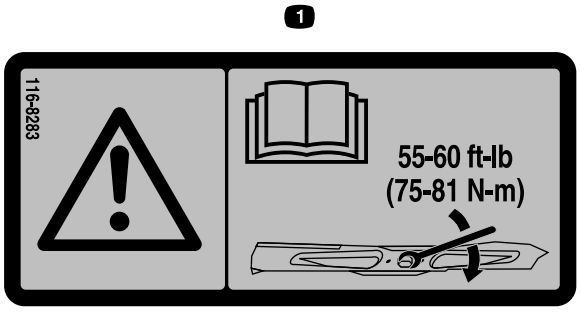
1. Warning—stay away from moving parts; keep all guards and shields in place.



decal116-5988

116-5988

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



decal116-8283

116-8283

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

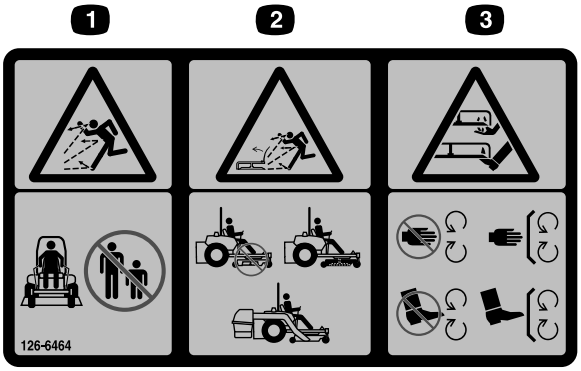


decal117-3276

117-3276

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

Side Discharge Mowers Only



decal126-6464

126-6464

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

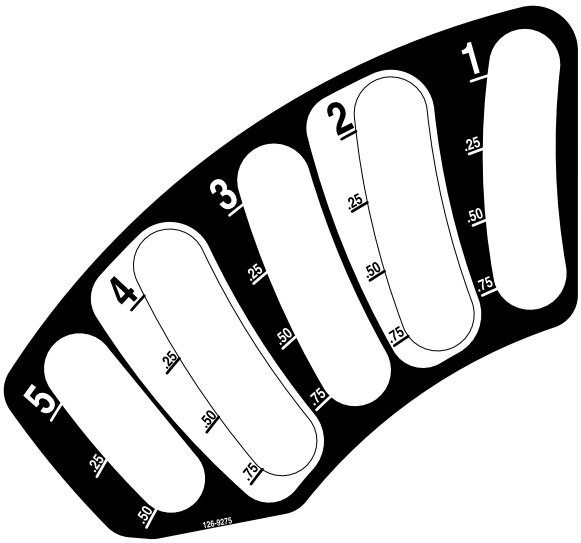


decal126-8383

126-8383

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

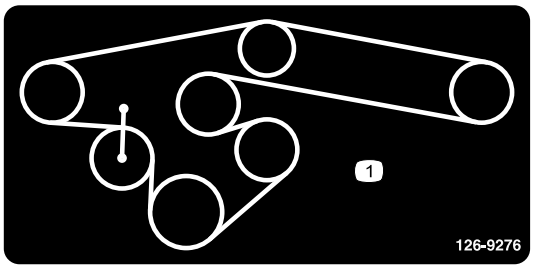
1. Warning—read the *Operator's Manual*; do not operate this machine unless you are trained; wear hearing protection.
2. Cutting/dismemberment hazard of the hand, mower blade; entanglement hazard of the hand, belt—stay away from moving parts; keep all guards and shields in place.
3. Ramp hazard—do not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



decal126-9275

126-9275

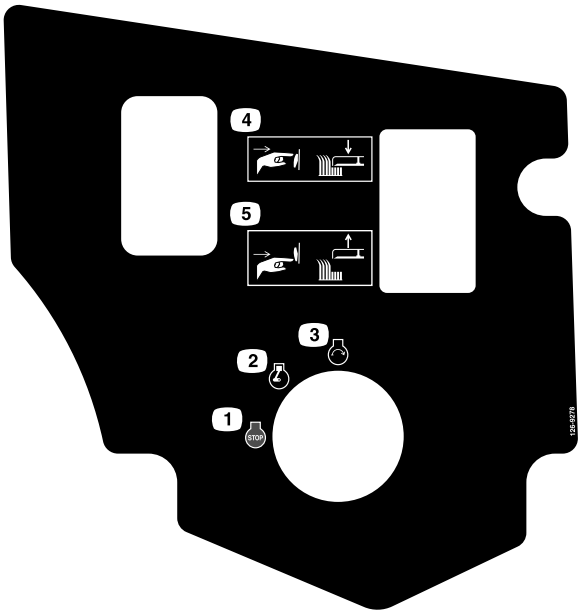
For Models with 183 cm (72-inch) Decks with Side Discharge



decal126-9276

126-9276

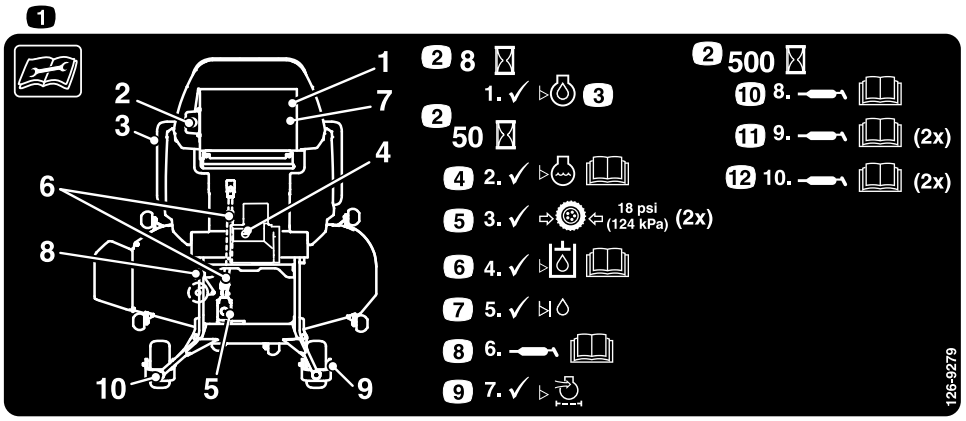
1. Belt routing



decal126-9278

126-9278

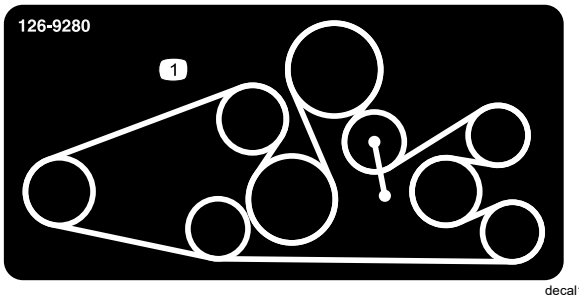
1. Engine—Off
2. Engine—On
3. Engine—Start
4. Push the bottom of the button to lower the deck.
5. Push the top of the button to raise the deck.



decal126-9279

126-9279

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

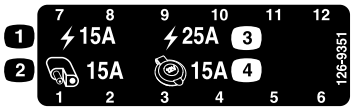


decal126-9280

126-9280

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

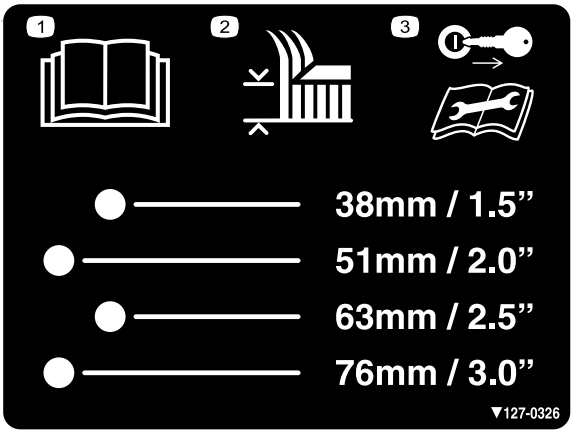
1. Belt routing



decal126-9351

126-9351

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

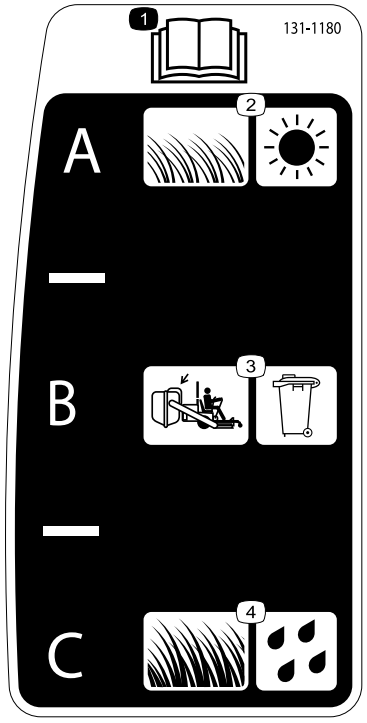


decal127-0326

127-0326

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

Side Discharge Mowers Only

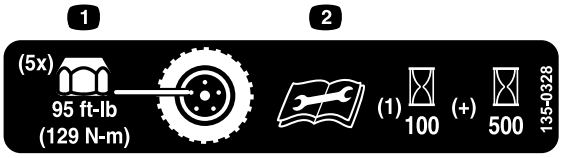


decal131-1180

131-1180

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

---



decal135-0328

135-0328

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

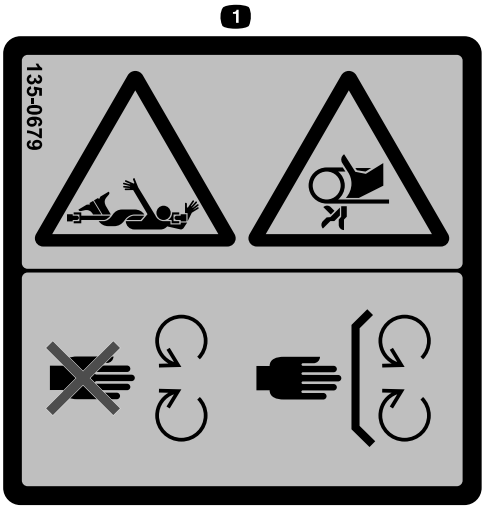
Rear Discharge Mowers Only



decal135-0664

135-0664

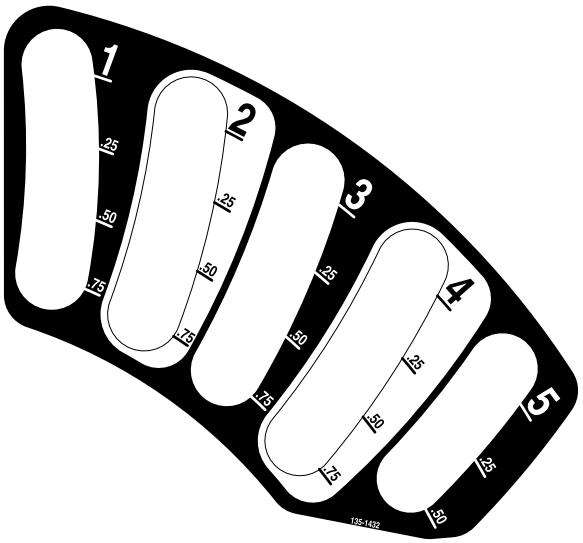
1. Thrown object hazard—keep bystanders away.
2. Cutting/dismemberment hazard of hands and feet—stay away from moving parts; keep all guards and shields in place.



decal135-0679

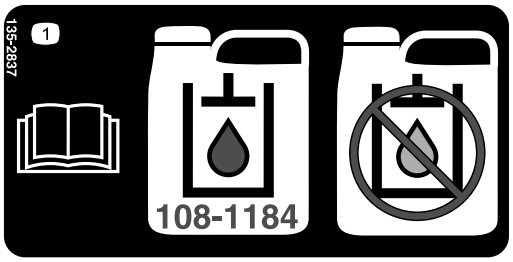
135-0679

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



decal135-1432

135-1432



decal135-2837

135-2837

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



decal133-8062

133-8062

Product Overview

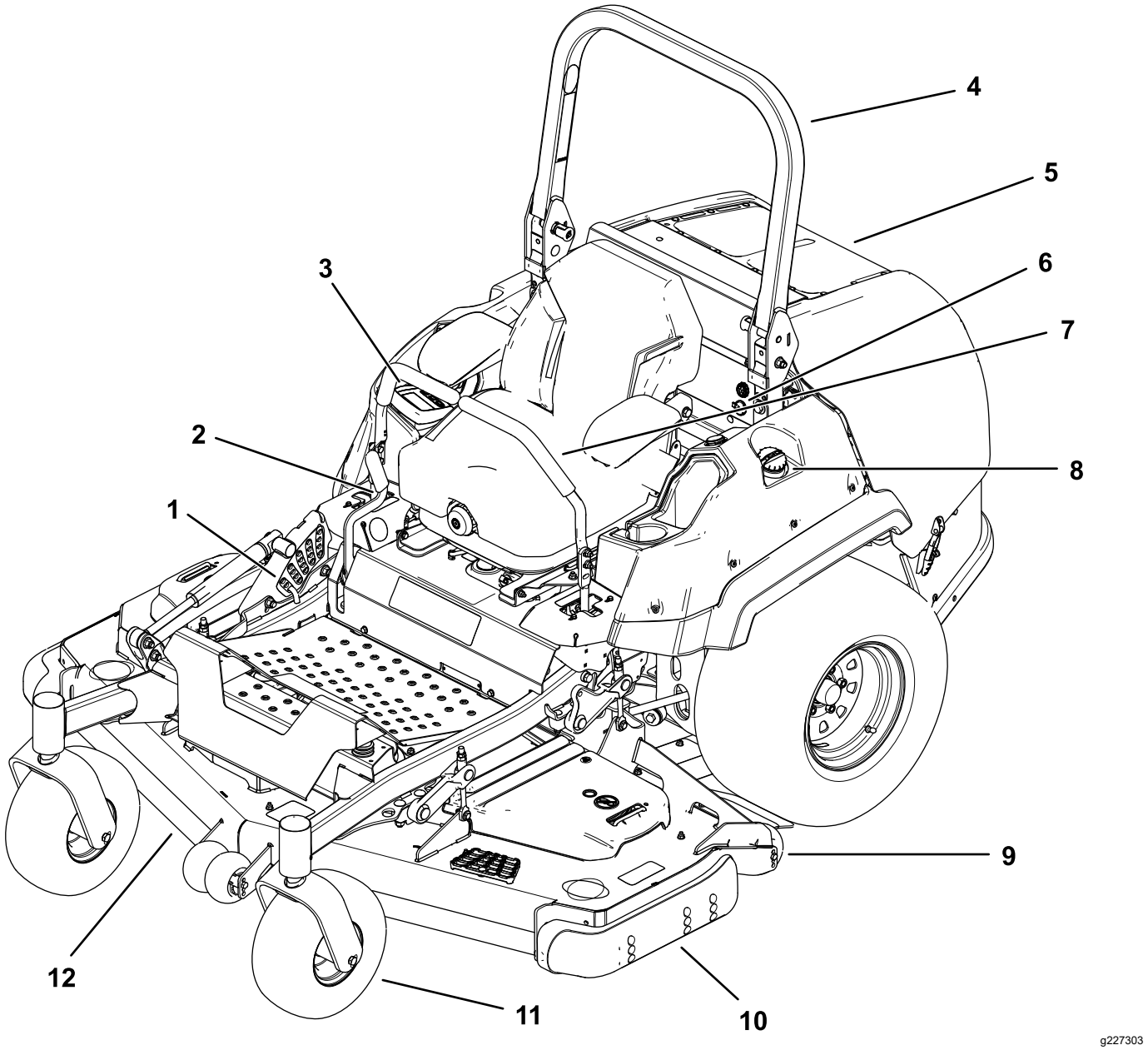


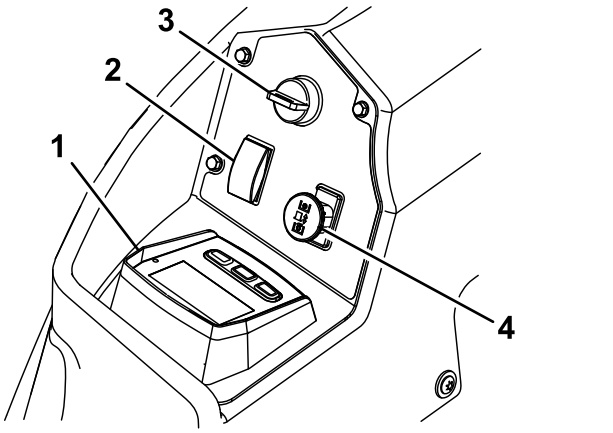
Figure 4

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

Controls

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

Control Panel



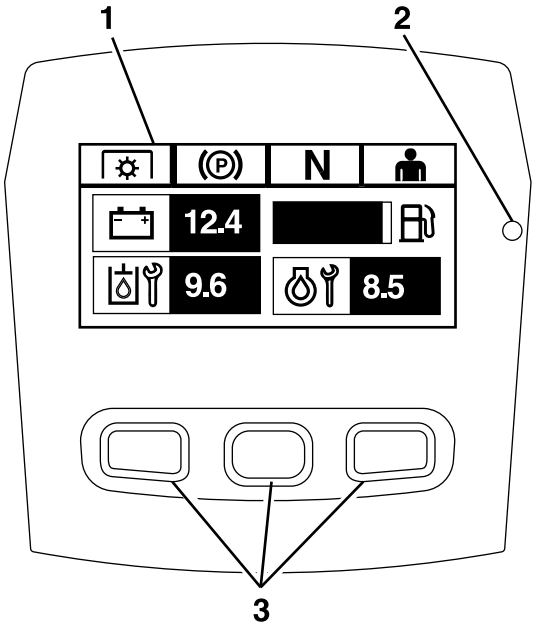
g225792

Figure 5

1. Horizon display monitor
2. Deck-lift switch
3. Key switch
4. Blade-control switch (power takeoff)

Horizon Display Monitor

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



g228164

Figure 6
Horizon Display Monitor

1. Screen
2. LED status light
3. Buttons

Information Screen

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

Buttons

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

Refer to the *Software Guide* for more information.

LED Status Light

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

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

Refer to the *Software Guide* for more information.

Alarm

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

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

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

Refer to the *Software Guide* for more information.

Hour Meter

The hour meter records the number of hours the engine has operated. It operates when the engine is running. Use these times for scheduling regular maintenance (Figure 5).

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

Refer to the *Software Guide* for more information.

Key Switch

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

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

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

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

Throttle Control

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

Refer to the *Software Guide* for more information.

Blade-Control Switch (Power Takeoff)

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

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

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

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

Deck-Lift Switch

Press the switch rearward to raise the deck.

Press the switch forward to lower the deck.

Motion-Control Levers

Use the motion-control levers to drive the machine forward, reverse, and turn either direction (Figure 4).

Neutral-Lock Position

Move the motion-control levers outward from the center to the NEUTRAL-LOCK position when exiting the machine (Figure 21). Always position the motion-control levers into the NEUTRAL-LOCK position when you stop the machine or leave it unattended.

Parking-Brake Lever

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

Specifications

Overall Width—Side Discharge Machines

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

Overall Width—Rear Discharge Machines

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

Overall Length—Side Discharge Machines

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

Overall Length—Rear Discharge Machines

Roll bar up or down	255.5 cm (100.6 inches)

Overall Height—All Machines

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

Overall Height—All Machines

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

Tread Width of Drive Wheels—All Machines

112 cm (44.1 inches)

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

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

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

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

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

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

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

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

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.

Operation

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

Before Operation

Before Operation Safety

General Safety

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

⚠ CAUTION

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

Wear hearing protection when operating this machine.

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

Fuel Safety

Use extreme care when handling fuel.

⚠ DANGER

In certain conditions fuel is extremely flammable and vapors are explosive.

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

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

⚠ DANGER

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

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

⚠ WARNING

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

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

⚠ CAUTION

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

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

To help prevent fires:

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

Adding Fuel

Recommended Fuel

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

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

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

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

Biodiesel Ready

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

Observe the following precautions:

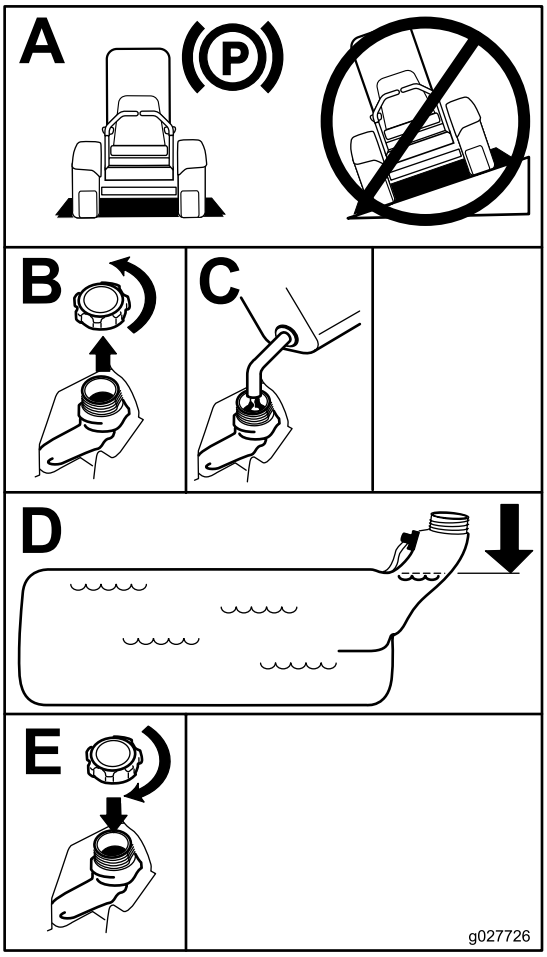
- The biodiesel portion of the fuel meet specification ASTM D6751 or EN14214.
- The blended fuel composition should meet ASTM D975 or EN590.
- Painted surfaces may be damaged by biodiesel blends.
- Use B5 (biodiesel content of 5%) or lesser blend in cold weather.
- Monitor seals, hoses, gaskets in contact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

- Fuel filter plugging may be expected for a time after converting to biodiesel blends.
- Contact your distributor for more information on biodiesel.

Filling the Fuel Tank

1. Park the machine on a level surface.
2. Engage the parking brake.
3. Shut off the engine and remove the key.
4. Clean around the fuel-tank cap.
5. Fill the fuel tank to the bottom of the filler neck (Figure 7).

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



g027726

Figure 7

Performing Daily Maintenance

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

Breaking in a New Machine

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

Using the Rollover Protection System (ROPS)

⚠ WARNING

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

Ensure that the seat is secured to the machine.

⚠ WARNING

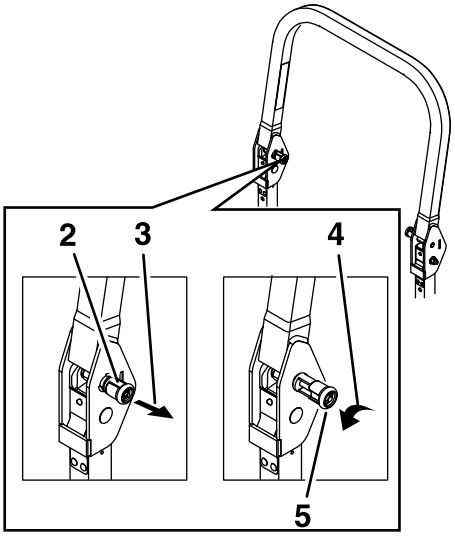
There is no rollover protection when the roll bar is in the down position.

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

Lowering the Roll Bar

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

1. To lower the roll bar, apply forward pressure to the upper part of the roll bar.
2. Pull both knobs out and rotate them 90 degrees so they are not engaged (Figure 8).
3. Lower the roll bar to the down position (Figure 8).



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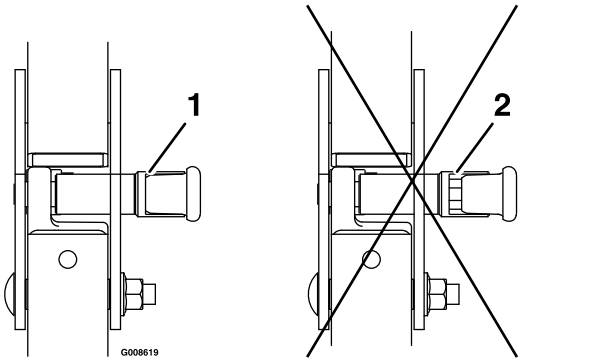
Figure 8

1. Upper part of the roll bar
2. Knob in the latched position
3. Pull the knob to unlatch.
4. Rotate the knob out 90° to hold it in the unlatched position.
5. Knob in the unlatched position

Raising the Roll Bar

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

1. Raise the roll bar to the operating position and rotate the knobs until they move partially into the grooves (Figure 9).
2. Raise the roll bar to the full upright position while pushing on the upper roll bar so that the pins snap into position when the holes align with the pins (Figure 9).
3. Push on the roll bar and ensure that both pins are engaged (Figure 9).



g008619

Figure 9

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

Using the Safety-Interlock System

⚠ WARNING

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

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

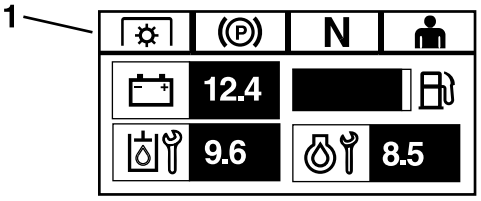
Understanding the Safety-Interlock System

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

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

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

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



g230650

Figure 10

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

Testing the Safety-Interlock System

Service Interval: Before each use or daily

Test the safety-interlock system before you use the machine each time. If the safety system does not

operate as described below, have an Authorized Service Dealer repair the safety system immediately.

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

Positioning the Seat

The seat can move forward and backward. Position the seat where you have the best control of the machine and are most comfortable (Figure 11).

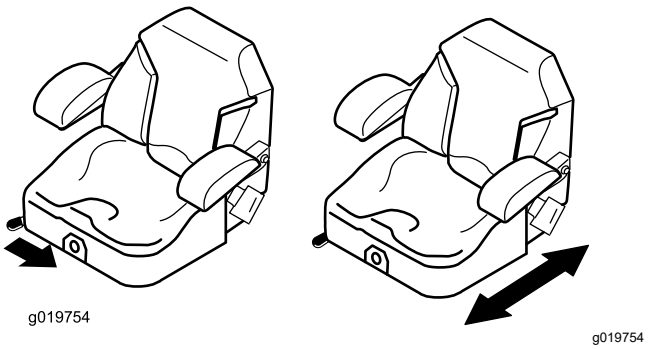


Figure 11

Unlatching the Seat

To unlatch the seat, push the seat latch forward (Figure 12).

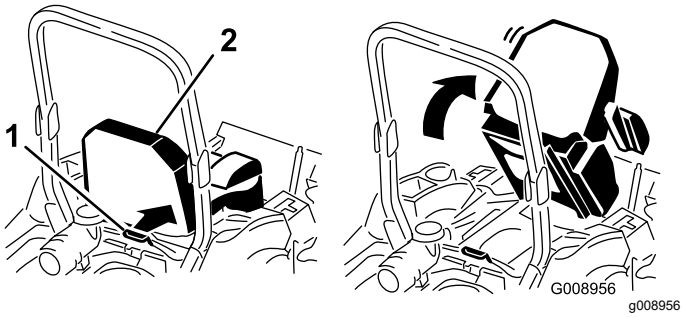


Figure 12

1. Seat latch
2. Seat

Changing the Seat Suspension

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

To adjust it, turn the knob in front either direction to provide the best comfort (Figure 13).

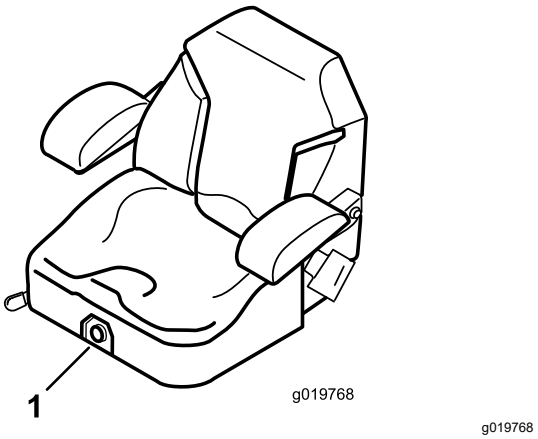


Figure 13

1. Seat-suspension knob

During Operation

During Operation Safety

General Safety

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

⚠ WARNING

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

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

⚠ WARNING

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

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

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

⚠ WARNING

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

- **– Do not operate the machine without guards, shields, and safety devices in place and working properly.**
- **– Keep hands, feet, hair, jewelry, or clothing away from rotating parts.**

- Never raise the deck with blades running.
- Be aware of the mower discharge path and direct discharge away from others. Avoid discharging material against a wall or obstruction as the material may ricochet back toward the operator. Stop the blades, slow down, and use caution when crossing surfaces other than grass and when transporting the mower to and from the area to be mowed.
- Be alert, slow down and use caution when making turns. Look behind and to the side before changing directions. Do not mow in reverse unless absolutely necessary.
- Do not change the engine governor setting or overspeed the engine.
- Park the machine on level ground. Shut off the engine and wait for all moving parts to stop.
  - – Before checking, cleaning or working on the mower.
  - – After striking a foreign object or abnormal vibration occurs (inspect the mower for damage and make repairs before restarting and operating the mower).
  - – Before clearing blockages.

– Whenever you leave the mower. Do not leave a running machine unattended.

- Stop engine, wait for all moving parts to stop:
  – Before refueling.
  – Before dumping the grass catcher.
  – Before making height adjustments.
- Tragic accidents can occur if the operator is not alert to the presence of children. Children are often attracted to the machine and the mowing activity. Never assume that children will remain where you last saw them.
  – Keep children out of the mowing area and under the watchful care of another responsible adult, not the operator.
  – Be alert and turn the machine off if children enter the area.
  – Before and while backing or changing direction, look behind, down, and side-to-side for small children.
  – Never allow children to operate the machine.
  – Do not carry children, even with the blades shut off. Children could fall off and be seriously injured or interfere with the safe operation of the machine. Children that have been given rides in the past could suddenly appear in the working area for another ride and be run over or backed over by the machine.

Slope Safety

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

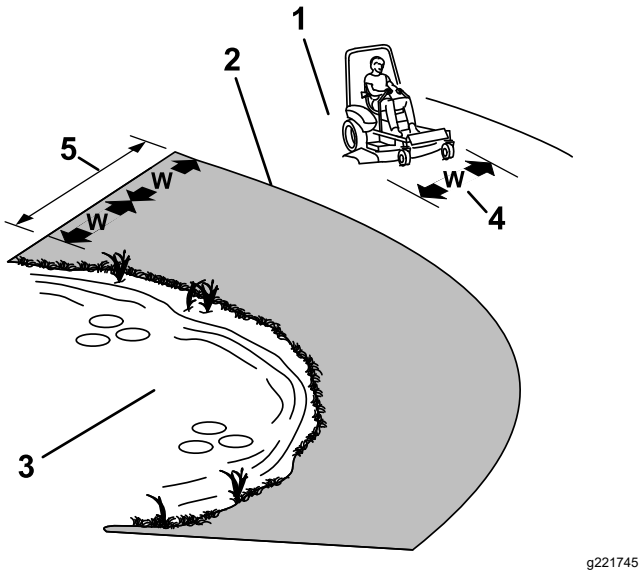


Figure 14

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

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

Rollover Protection System (ROPS) Safety

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

⚠ WARNING

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

- **Do not remove the ROPS.**
- **Keep the roll bar in the raised and locked position and use seat belt.**
- **Lower the roll bar only when absolutely necessary.**
- **Do not wear seat belt when the roll bar is down.**
- **Drive slowly and carefully.**
- **Raise the roll bar as soon as clearance permits.**

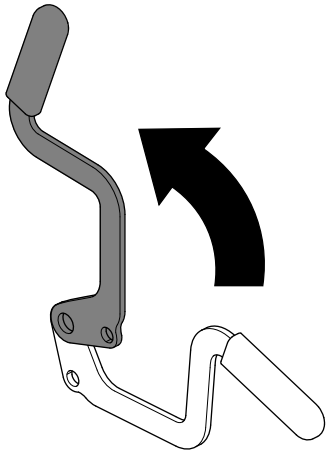
- Be certain that the seat belt can be released quickly in the event of an emergency.
- Check carefully for overhead clearances (i.e. branches, doorways, and electrical wires) before driving under any objects and do not contact them.
- In the event of a rollover, take the unit to an Authorized Service Dealer to have the ROPS inspected.
- Replace a damaged ROPS. Do not repair or revise.
- Any accessories, alterations, or attachments added to the ROPS must be approved by Toro.

Operating the Parking Brake

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

Engaging the Parking Brake

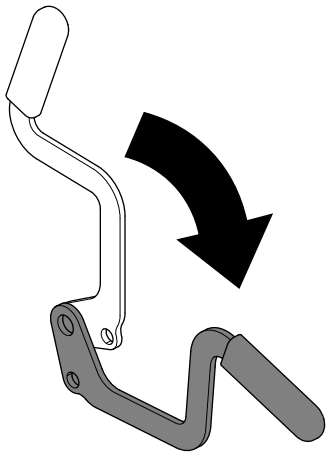
Park the machine on a level surface.



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Figure 15

Disengaging the Parking Brake



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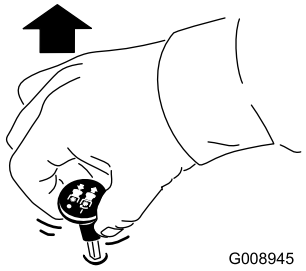
Figure 16

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)

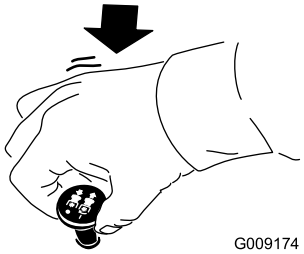
Note: Engaging the blade-control switch (PTO) with the throttle position at half or less causes excessive wear to the drive belts.



g008945

Figure 17

Disengaging the Blade-Control Switch (PTO)



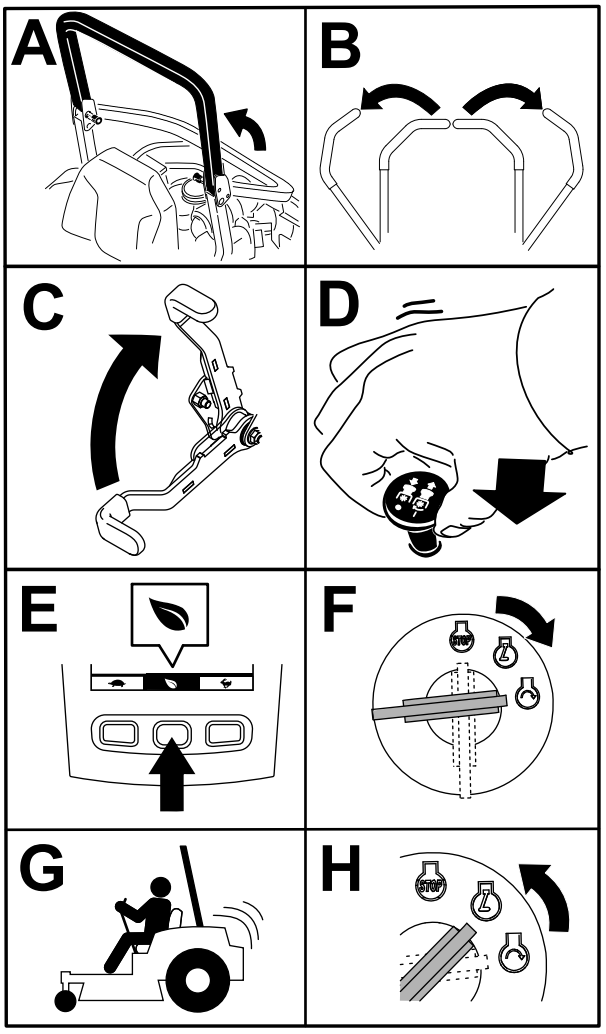
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Figure 18

Starting the Engine

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

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



g230704

Figure 19

Shutting Off the Engine

⚠ CAUTION

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

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

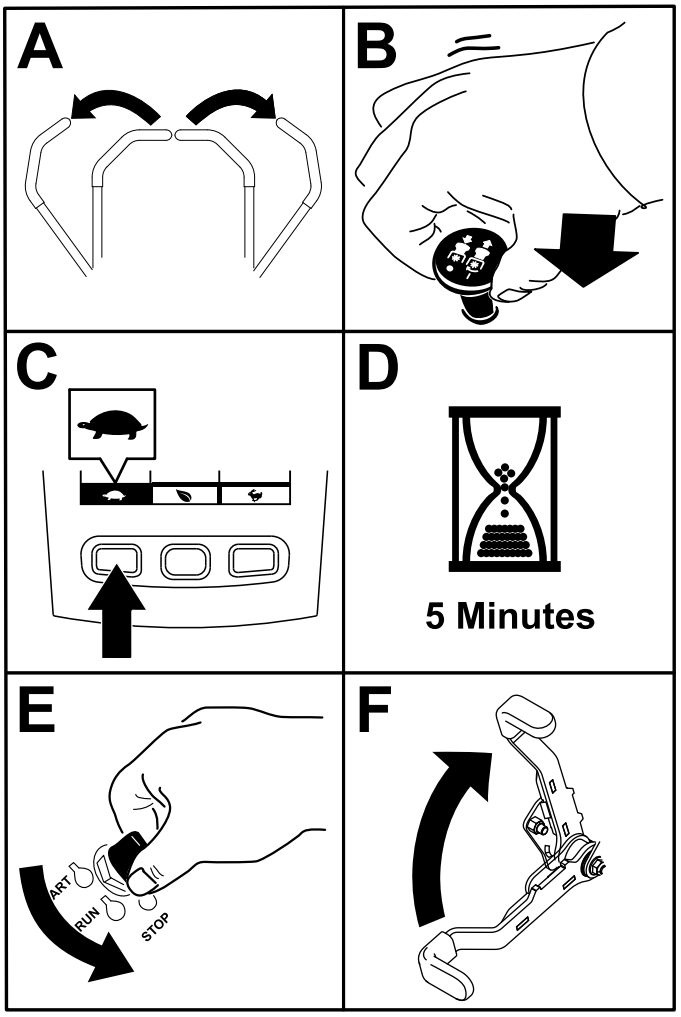


Figure 20

Using the Motion-Control Levers

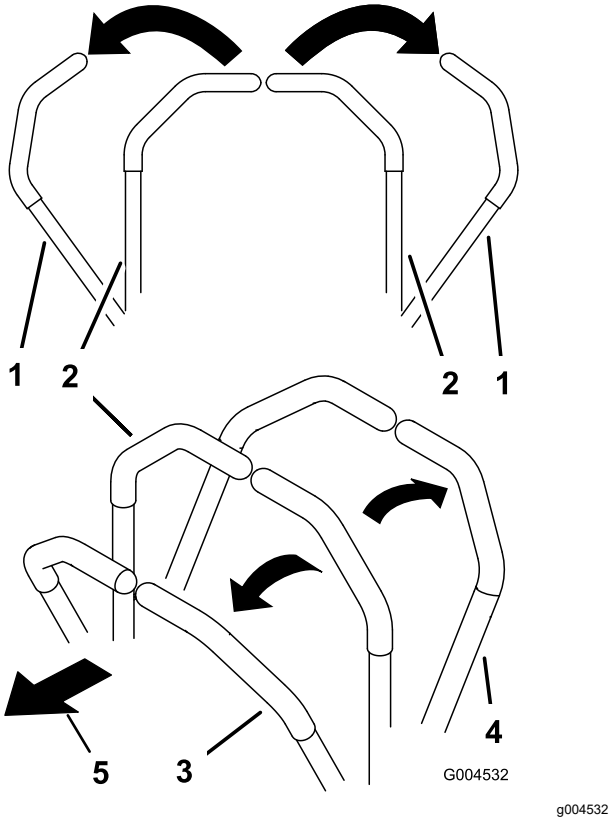


Figure 21

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 24).
2. Move the levers to the center, unlocked position.
3. To go forward, slowly push the motion-control levers forward (Figure 22).

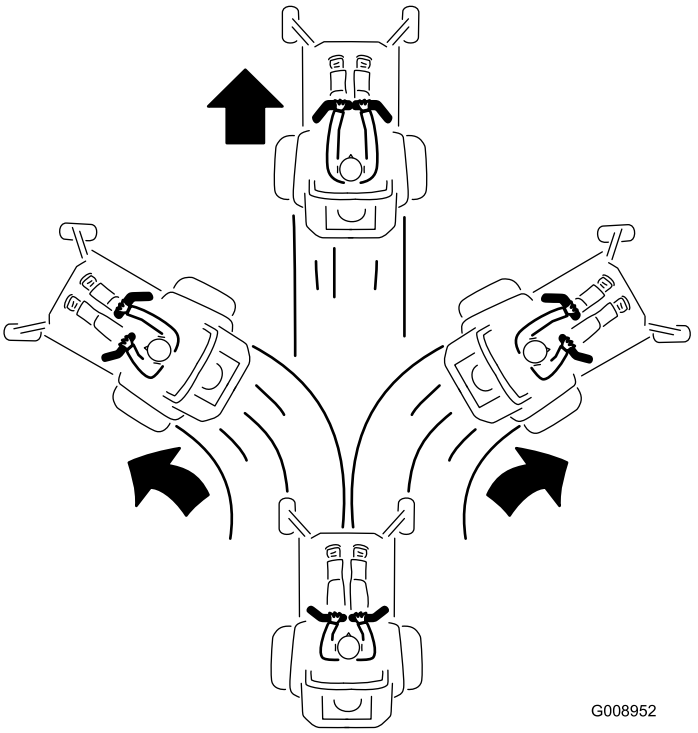


Figure 22

Driving Backward

1. Move the levers to the center, unlocked position.
2. To go backward, slowly pull the motion-control levers rearward (Figure 23).

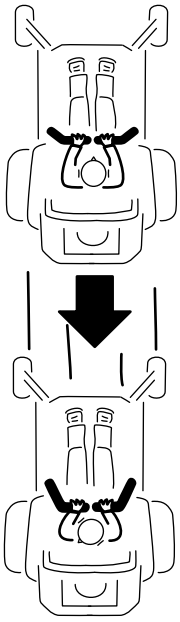


Figure 23

Using the Side Discharge

Machines with Side Discharge Only

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

⚠ DANGER

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

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

Adjusting the Height of Cut

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

1. With the engine running, push the deck-lift switch rearward until the mower deck is fully raised, and release the switch immediately.
2. Rotate the height-of-cut pin until the roll pin in it lines up with the slots in the holes in the height-of-cut bracket and remove it (Figure 24).
3. Insert the height-of-cut pin into the hole corresponding to the desired cutting height (Figure 24).

   Refer to the decal on the side of the deck-lift plate for the heights of cut (Figure 24).
4. Using the deck-lift switch, move the deck height out of the transport position (or 5-1/2 inches (140 mm) cutting height) and down to the selected height.

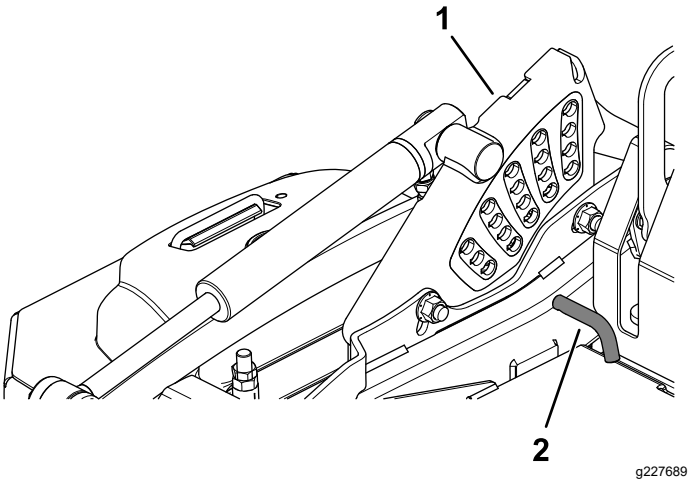


Figure 24

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

Adjusting the Anti-Scalp Rollers

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

1. Park the machine on a level surface.
2. Disengage the blade-control switch (PTO), move the motion-control levers to the NEUTRAL-LOCK position, and engage the parking brake.
3. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
4. Adjust the anti-scalp rollers as shown in Figure 25, Figure 26, Figure 27, and Figure 28.

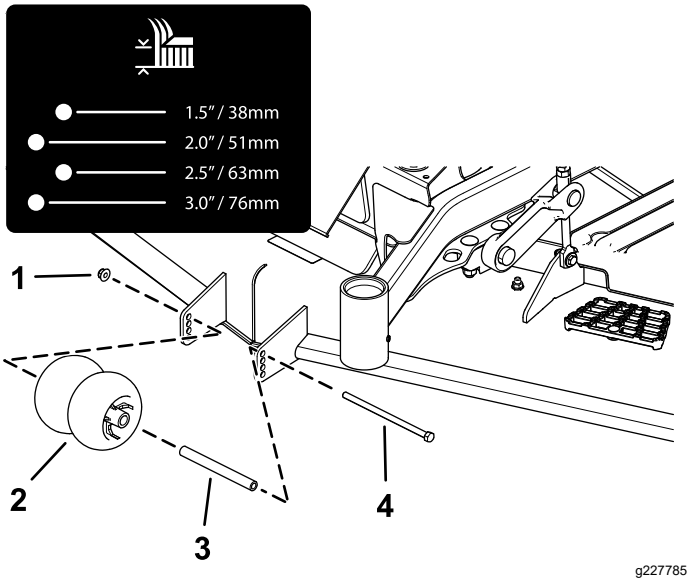


Figure 25

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

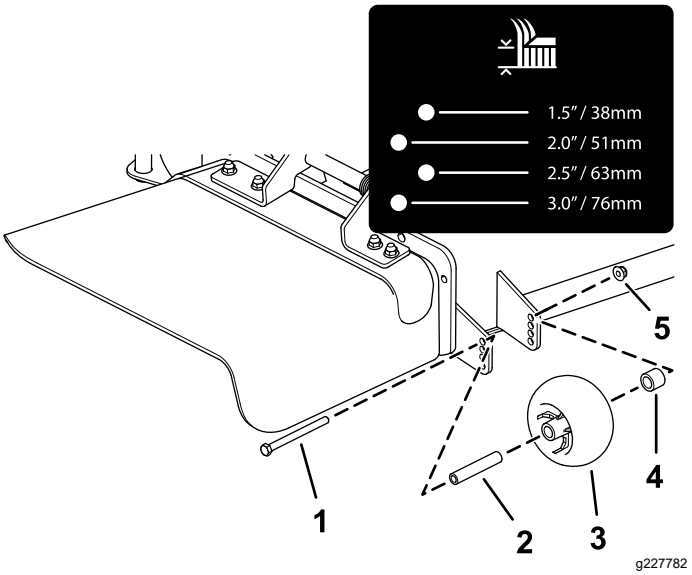


Figure 26
Side Discharge Machines

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

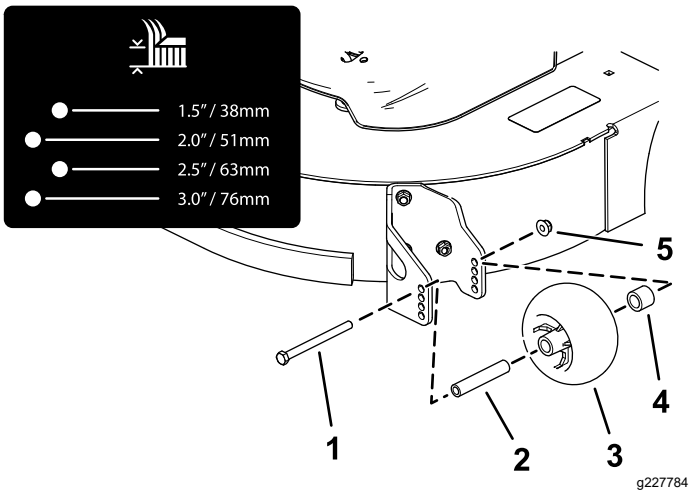


Figure 27
Side Discharge Machines

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

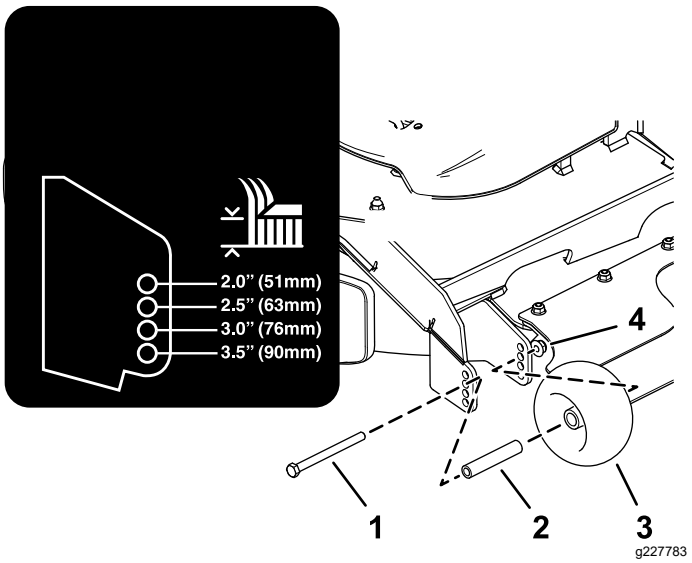


Figure 28
Rear Discharge Machines

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

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

Adjusting the Skids

For Models with Rear Discharge

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

Adjust the skids as shown in Figure 29.

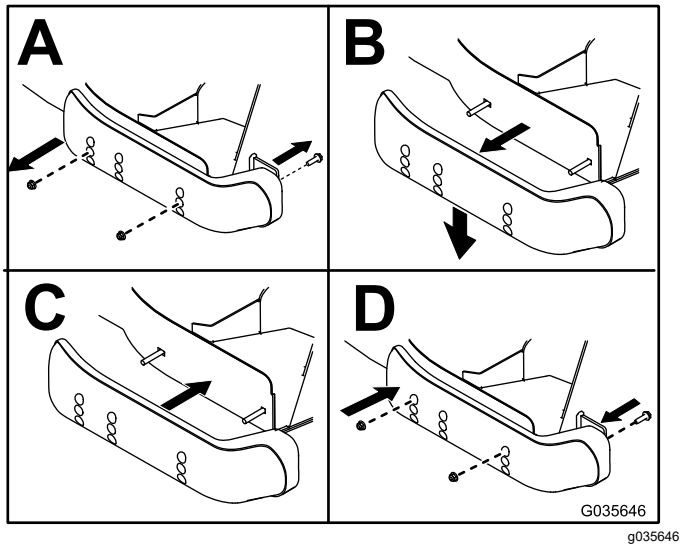


Figure 29

Adjusting the Flow Baffle Knob

For Machines with Side Discharge

This procedure applies only to machines with the flow baffle knob. Certain models have nuts and bolts instead of the flow baffle knob that you can adjust the same way.

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

1. Park the machine on a level surface, disengage the blade-control switch, and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Loosen the knob.
4. Slide the knob to the desired position.
5. Tighten the knob.

Positioning the Flow Baffle

For Machines with Side Discharge

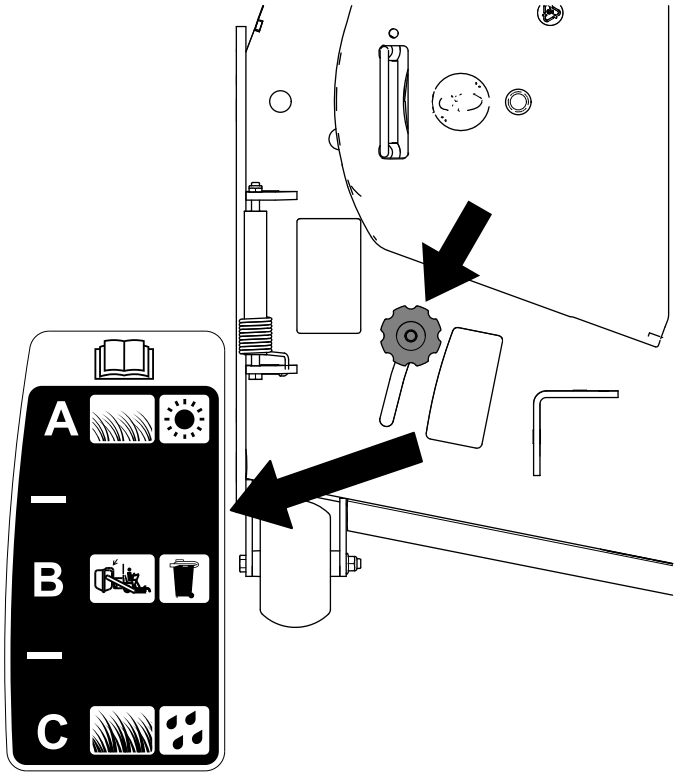
The following figures are recommendations only. Adjustments vary by grass type, moisture content, and the height of the grass.

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

Position A

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

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

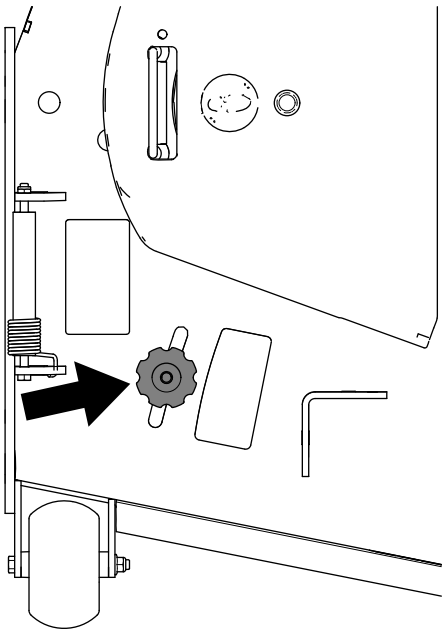


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Figure 30

Position B

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



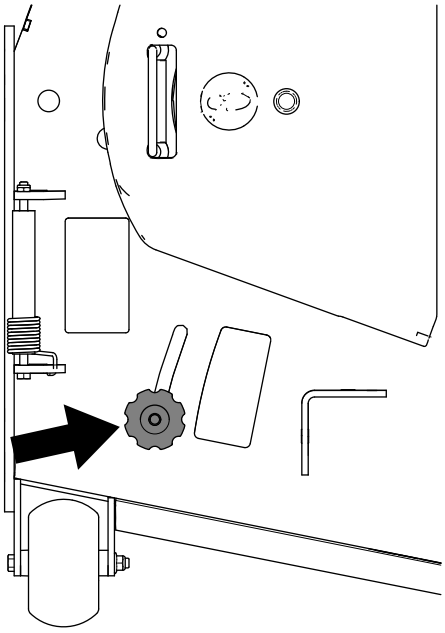
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Figure 31

Position C

This is the fully-forward position. The suggested use for this position is as follows:

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



g295812

Figure 32

Operating with the Overheat Sensor

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

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

Operating Tips

Using the Fast Throttle Setting

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

Cutting a Lawn for the First Time

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

Cutting a Third of the Grass Blade

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

Alternating the Mowing Direction

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

Mowing at Correct Intervals

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

Using a Slower Cutting Speed

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

Avoiding Cutting Too Low

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

Stopping the Machine

If you must stop the forward motion of the machine while mowing, a clump of grass clippings may drop onto your lawn. To avoid this, move onto a previously cut area with the blades engaged or you can disengage the mower deck while moving forward.

Keeping the Underside of the Mower Deck Clean

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

Maintaining the Blade(s)

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

After Operation

After Operation Safety

General Safety

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

Using the Drive-Wheel Release Valves

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

Rotate each bypass valve counterclockwise 1 turn to release; rotate each bypass valve clockwise to reset the system (Figure 33).

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

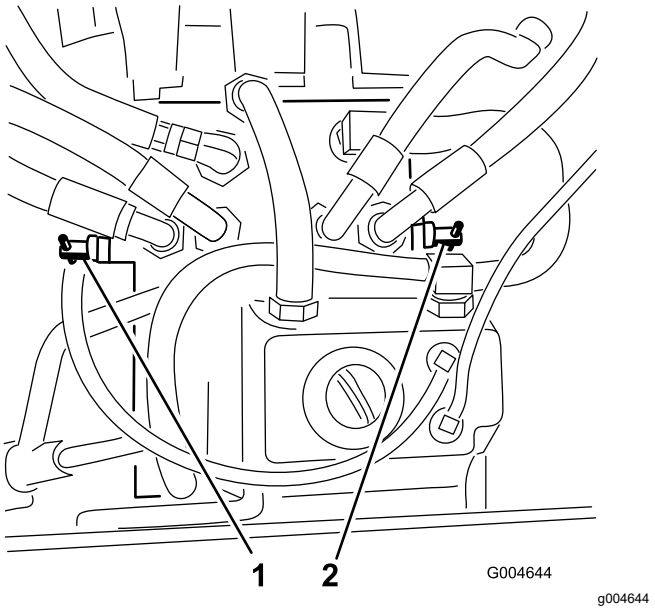


Figure 33

1. Right bypass valve
2. Left bypass valve

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 34).

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

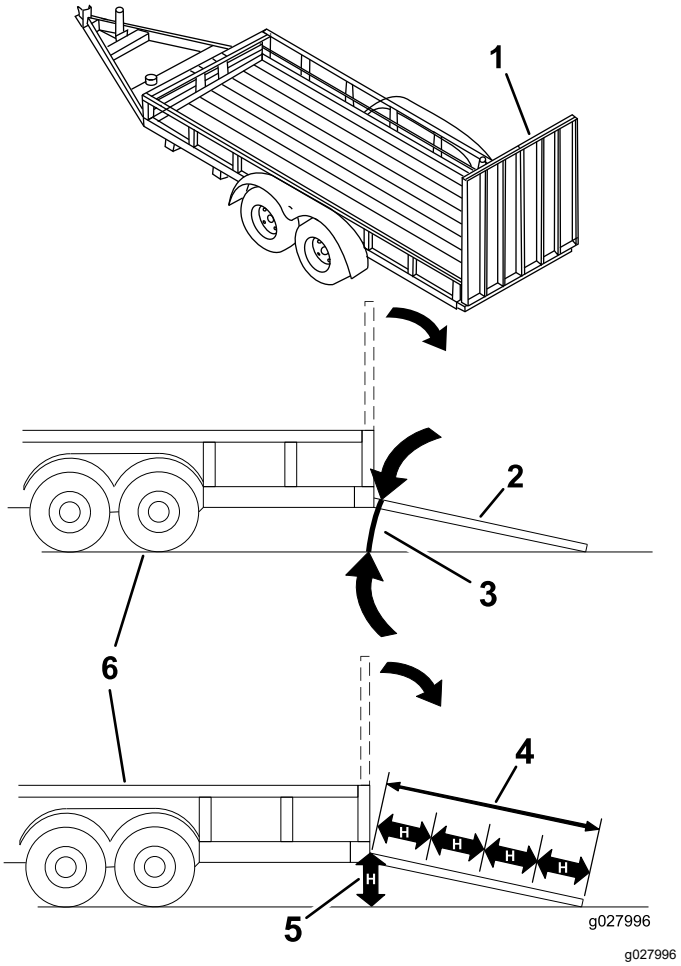


Figure 34

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 34).
4. Back the machine up the ramp (Figure 35).

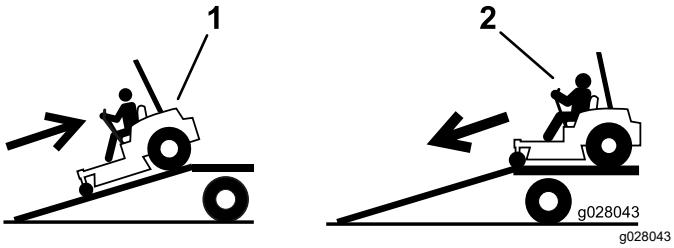


Figure 35

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 frame with straps, chains, cable, or ropes (Figure 36). Refer to local regulations for tie-down requirements.

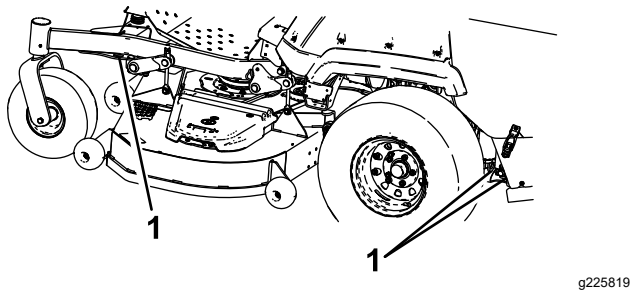


Figure 36

1. Tie-down points

Unloading the Machine

1. Lower the ramp, ensuring that the angle between the ramp and the ground does not exceed 15 degrees (Figure 34).
2. Drive the machine forward down the ramp (Figure 35).

Maintenance

Maintenance Safety

⚠ WARNING

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

Remove the key from the ignition switch and engage parking brake before you do any maintenance.

⚠ WARNING

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

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

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

⚠ WARNING

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

⚠ WARNING

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

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

⚠ WARNING

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

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

- Use care when checking blades. Wrap the blade(s) or wear gloves, and use caution when servicing them. Only replace damaged blades. Never straighten or weld them.
- Use jack stands to support the machine and/or components when required.

⚠ CAUTION

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

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

- Carefully release pressure from components with stored energy.
- Keep hands and feet away from moving parts. If possible, do not make adjustments with the engine running. If the maintenance or adjustment procedure require the engine to be running and components moving, use extreme caution.

⚠ WARNING

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

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

- Check all bolts frequently to maintain proper tightness.

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first 100 hours	• Check the wheel lug nuts. • Adjust the parking brake.
After the first 200 hours	• Change the engine oil and filter. • Change the deck gearbox oil. • Change the hydraulic fluid and filter.
Before each use or daily	• Check the safety-interlock system. • Check the engine-oil level. • Check the seat belt. • Check the engine-coolant level. • Check the hydraulic-fluid level. • Inspect the blades. • Clean the engine and exhaust system area. • Clean the grass and debris build-up from the machine and mower deck.
Every 50 hours	• Grease the drive U-joints and splined slip joint. • Drain the fuel filter/water separator. • Check the tire pressure • Check the gearbox-oil level. • Clean the engine-cooling system (more often in dirty and dusty conditions). • Inspect the belts for cracks and wear.
Every 100 hours	• Check the alternator-belt tension.
Every 200 hours	• Change the engine oil and filter if not using Toro Premium Engine Oil, but any oil meeting API classification CJ-4 or higher or as stated in Engine-Oil Specifications.
Every 400 hours	• Grease the deck-idler pivots. • Grease the caster pivots (more often in dirty or dusty conditions). • Service the air cleaner (More frequently in extremely dusty or dirty conditions). • Change the engine oil and filter if using Toro Premium Engine Oil (API classification CK-4 or higher) (more often in dirty or dusty conditions). • Replace the fuel-filter canister for the water separator (more often in dirty and dusty conditions). • Check the fuel lines and connections. • Change the deck gearbox oil. • Adjust the parking brake. • Change the hydraulic fluid and filter if using Mobil® 424 hydraulic fluid.
Every 500 hours	• Adjust the caster-pivot bearing.
Every 800 hours	• Inspect the engine-valve clearance. • Change the hydraulic fluid and filter if using Toro Premium Transmission/Hydraulic Tractor Fluid.
Every 2,000 hours	• Change the engine coolant.

Maintenance Service Interval	Maintenance Procedure
Monthly	• Check the battery charge.
Yearly	• Grease the deck drive PTO. • Repack the caster-wheel bearings (more often in dirty or dusty conditions). • Greasing the caster-wheel hubs. • If you operate the machine less than 200 hours, change the engine oil and filter.

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

⚠ CAUTION

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

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

Lubrication

Greasing the Machine

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

Yearly—Grease the deck drive PTO.

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

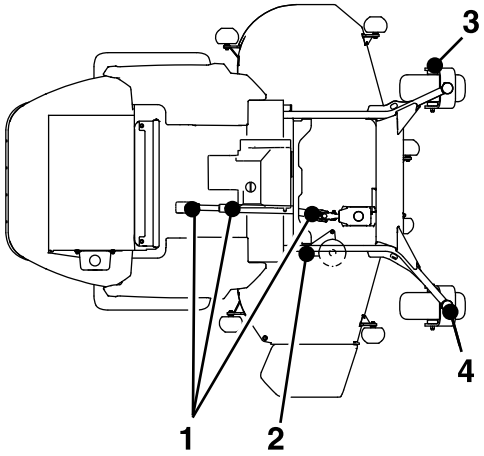
Grease Type: No. 2 lithium or molybdenum grease

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

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

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

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



Lubricating the Drive U-Joints and Splined Slip Joint

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

Note: For easier access to the drive U-joints and splined slip joint, remove the floor pan and fully lower the mower deck.

1. Park the machine on a level surface, disengage the blade-control switch, and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Clean the grease fittings with a rag.
4. Connect a grease gun to the fitting.
5. Pump grease into the fittings until grease begins to ooze out of the bearings.
6. Wipe up any excess grease.

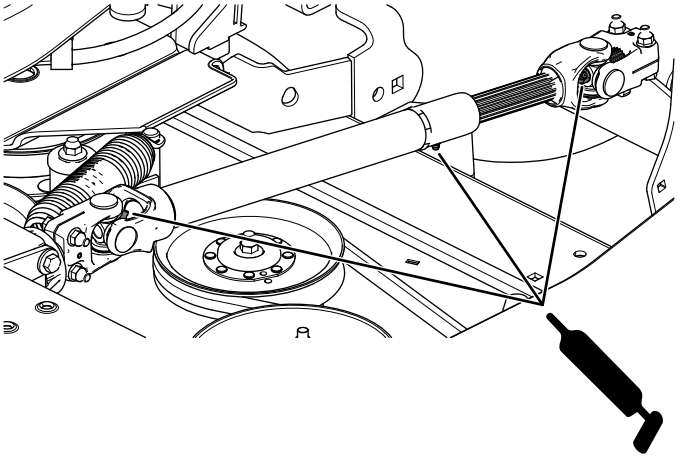


Figure 37

Greasing the Caster Pivots

Service Interval: Every 400 hours/Yearly (whichever comes first) (more often in dirty or dusty conditions).

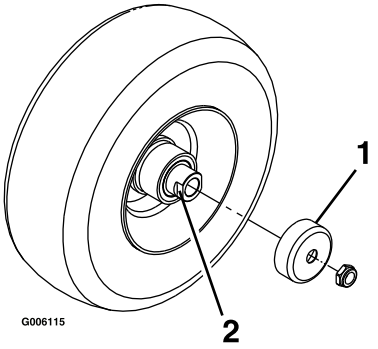
Yearly—Repack the caster-wheel bearings (more often in dirty or dusty conditions).

1. Park the machine on a level surface, disengage the blade-control switch, and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Remove the dust cap and adjust the caster pivots and keep the dust cap off until greasing is done; refer to Adjusting the Caster-Pivot Bearing (page 49).
4. Remove the hex plug.
5. Thread a grease fitting into the hole.
6. Pump grease into the fitting until it oozes out around the top bearing.
7. Remove the grease fitting from the hole. Install the hex plug and cap.

Greasing the Caster-Wheel Hubs

Service Interval: Yearly

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



g006115

Figure 38

1. Seal guard
2. Spacer nut with wrench flats

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

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

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

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

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

Engine Maintenance

Engine Safety

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

Servicing the Air Cleaner

Service Interval: Every 400 hours

Checking the Air Cleaner

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

   Replace a damaged air-cleaner body.
4. Check the air-intake system for leaks, damage, or loose hose clamps.
5. Service the air-cleaner filter and safety element when alerted (Figure 39).

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

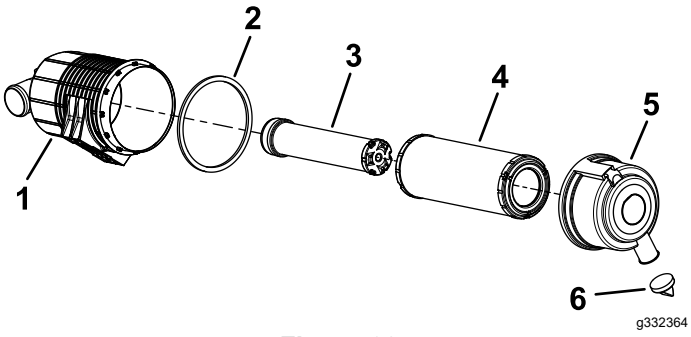


Figure 39

1. Air-cleaner body	4. Filter
2. Gasket	5. Air-cleaner cover
3. Safety element	6. Rubber outlet valve

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

Servicing the Air Cleaner

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

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

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

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

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

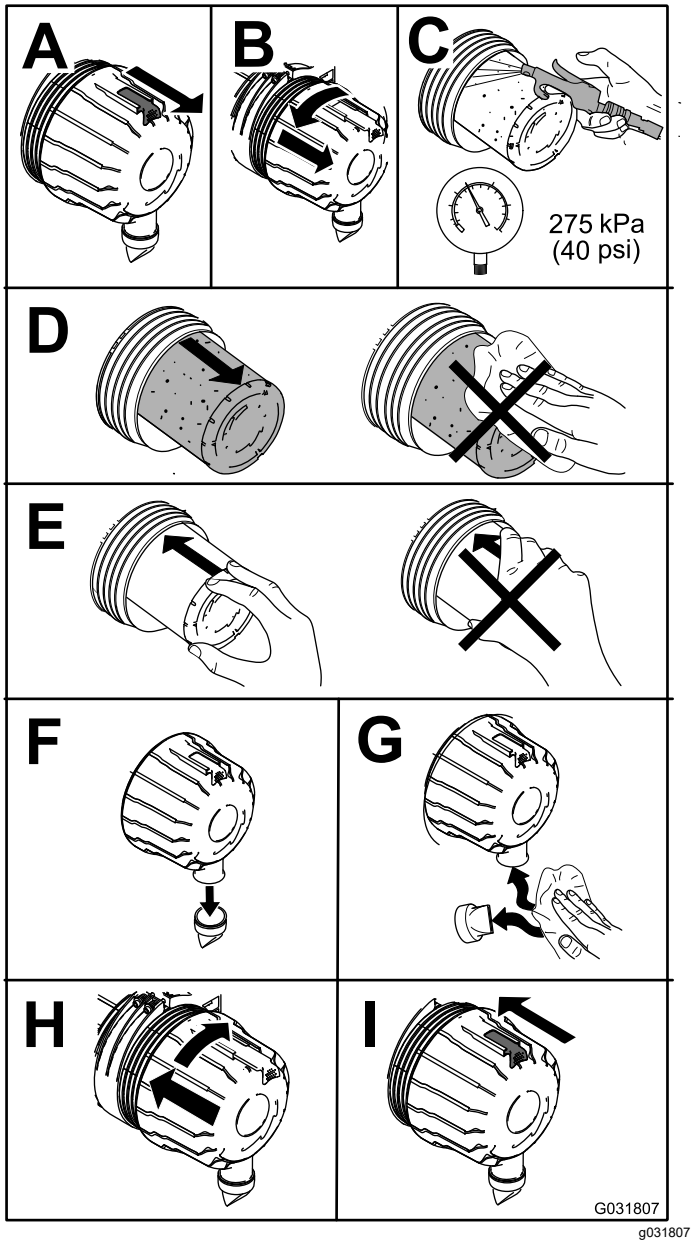


Figure 40

Servicing the Engine Oil

Service Interval: Before each use or daily

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

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

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

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

Engine-Oil Specifications

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

Crankcase capacity for Models 74028 and 74029: 4.7 L (5 US qt) with the filter

Crankcase capacity for Models 74060, 74064, 74072, and 74074: 6.6 L (7 US qt) with the filter

Preferred engine oil: Toro Premium Engine Oil

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

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

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

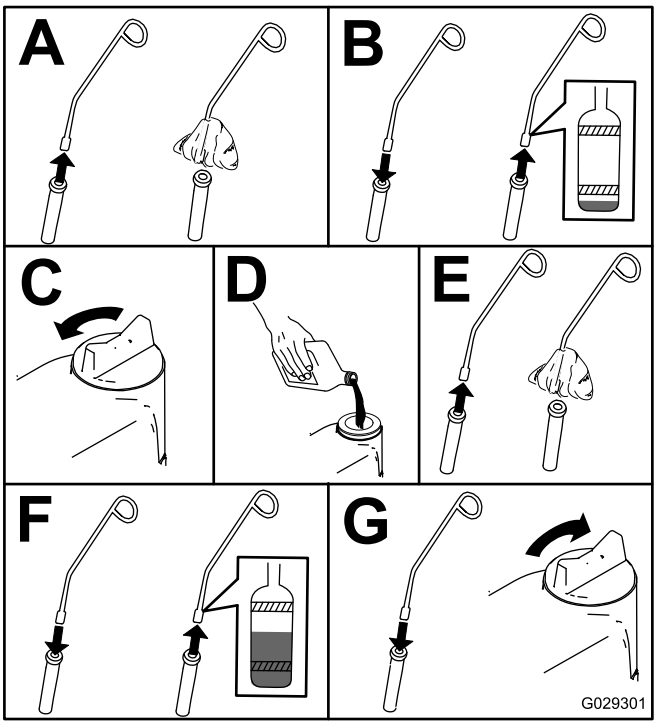
Use the following engine oil viscosity grade:

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

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

Checking the Engine-Oil Level

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. Open the hood.
4. Check the engine-oil level as shown in Figure 41.



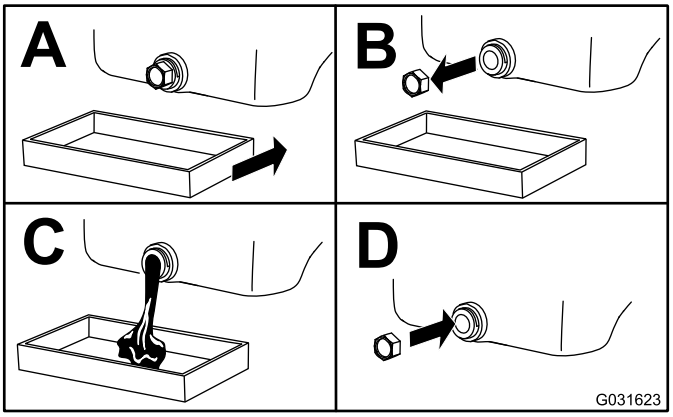
g029301

Figure 41

Changing the Engine Oil and Filter

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

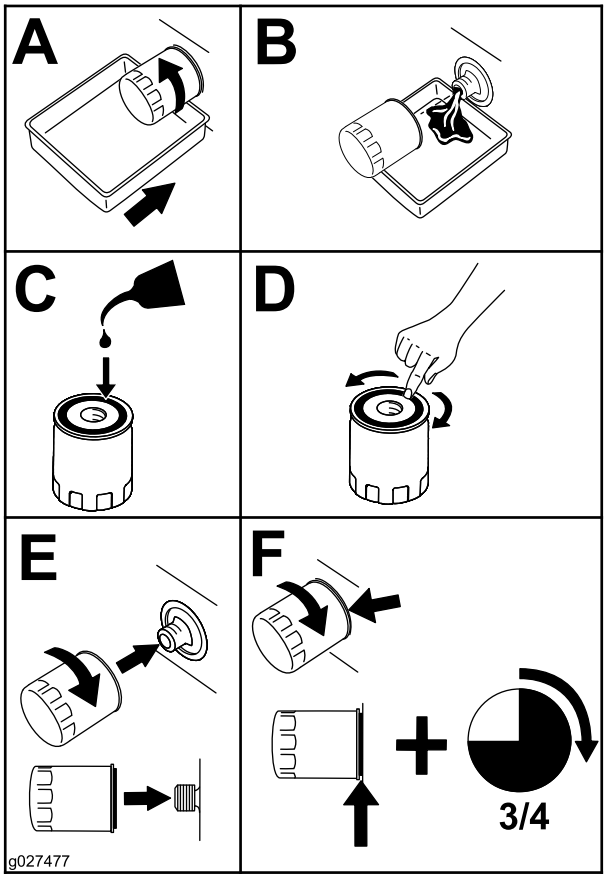
1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Open the hood.
4. Change the engine oil as shown in Figure 42.



g031623

Figure 42

5. Replace the engine-oil filter as shown in Figure 43.



g027477

Figure 43

6. Fill the crankcase with oil; refer to Servicing the Engine Oil (page 43).

Inspecting the Engine-Valve Clearance

Service Interval: Every 800 hours

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

Fuel System Maintenance

⚠ DANGER

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

Refer to Adding Fuel (page 18) for a complete list of fuel related precautions.

Draining the Fuel Filter/Water Separator

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

1. Park the machine on a level surface, disengage the blade-control switch, and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Place a drain pan below the fuel filter/water separator.
4. Open the drain plug on the water separator approximately 1 turn to allow water and other contaminates to drain (Figure 44).

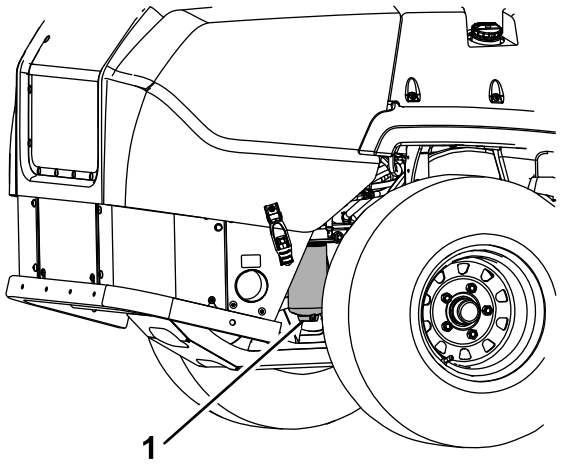


Figure 44

1. Fuel filter/water separator

5. Close the drain plug when only diesel fuel comes out.

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

Replacing the Water Separator

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

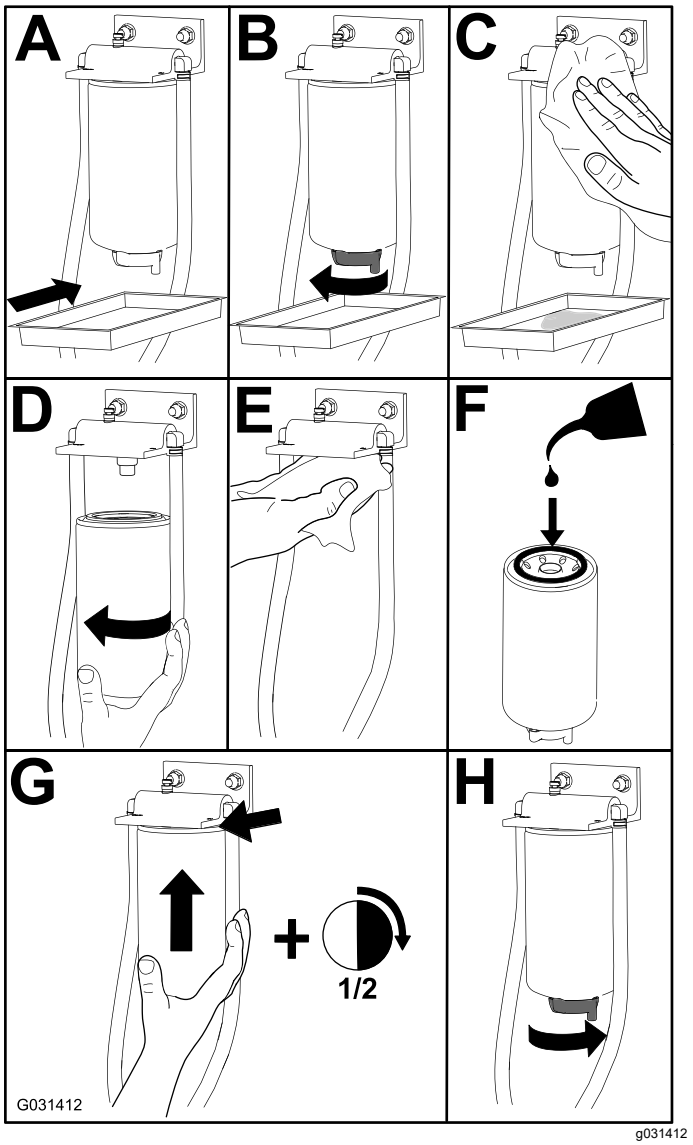


Figure 45

Checking the Fuel Lines and Connections

Service Interval: Every 400 hours

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

Electrical System Maintenance

Electrical System Safety

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

Servicing the Battery

⚠ DANGER

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

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

Removing the Battery

⚠ WARNING

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

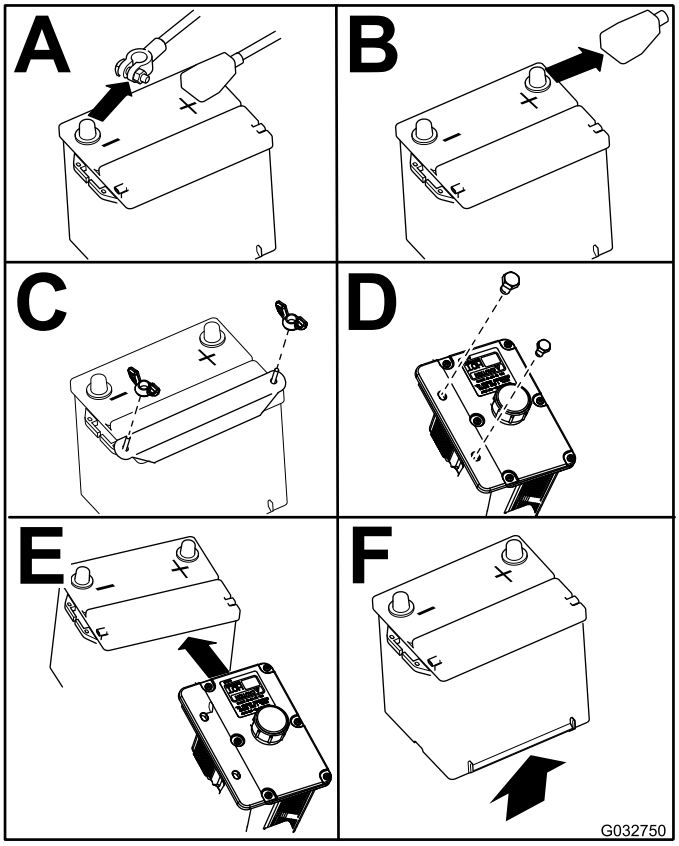
- **When removing or installing the battery, do not allow the battery terminals to touch any metal parts of the machine.**
- **Do not allow metal tools to short between the battery terminals and metal parts of the machine.**

⚠ WARNING

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

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

1. Disengage the blade-control switch (PTO), move the motion-control levers to the NEUTRAL-LOCK position, and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Unlatch the seat and tilt the seat up.
4. Remove the battery as shown in Figure 46.

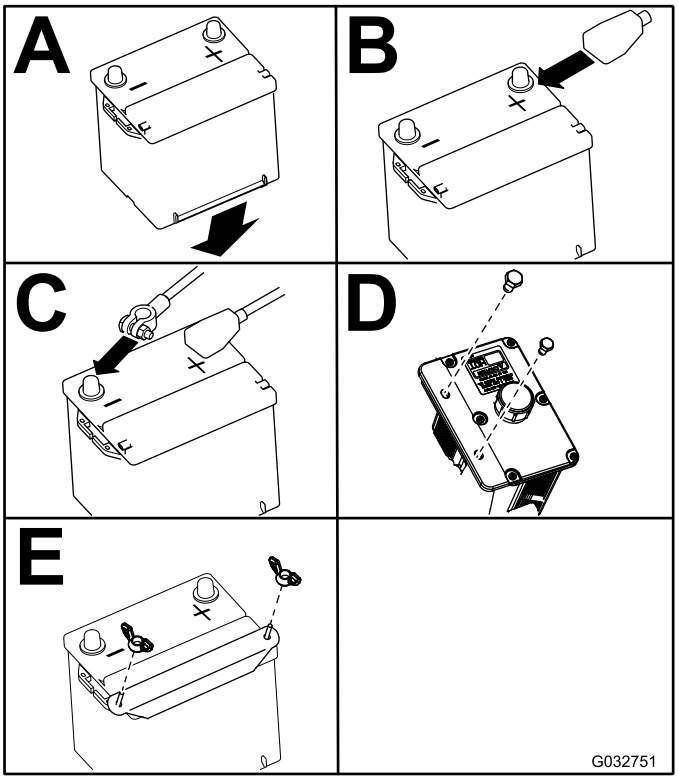


g032750

Figure 46

Installing the Battery

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



g032751

Figure 47

Charging the Battery

Service Interval: Monthly—Check the battery charge.

⚠ WARNING

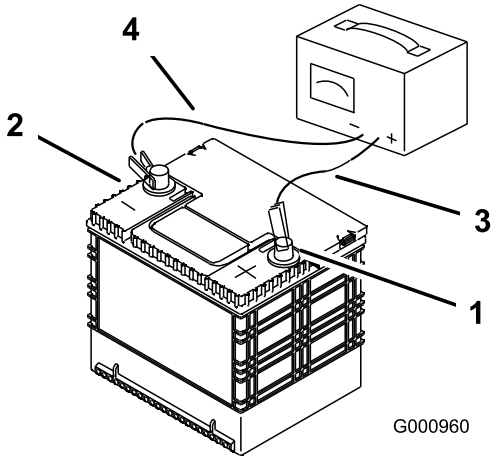
Charging the battery produces gasses that can explode.

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

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

1. Make sure that the filler caps are installed in battery. Charge battery for 10 to 15 minutes at 25 to 30 A or 30 minutes at 10 A.
2. When the battery is fully charged, unplug the charger from the electrical outlet, then disconnect the charger leads from the battery posts (Figure 48).
3. Install the battery in the machine and connect the battery cables, refer to Installing the Battery (page 47).

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



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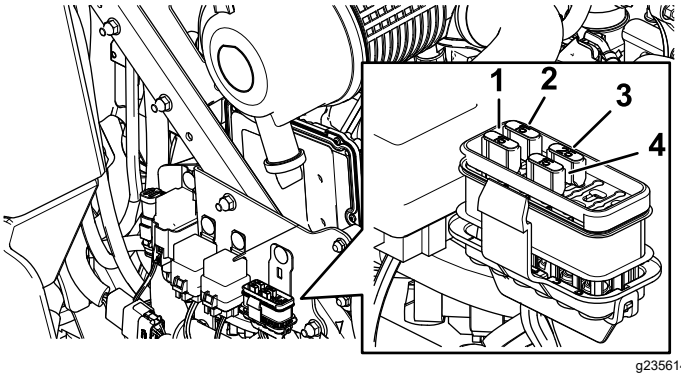
Figure 48

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

Servicing the Fuses

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

1. Unlatch the engine hood and raise the engine hood to gain access to the fuse block.
2. To replace the fuses, pull out on the fuse to remove it.
3. Install a new fuse (Figure 49).



g235614

Figure 49

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

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.

Adjusting the Tracking

1. Disengage the blade-control switch (PTO).
2. Drive to an open flat area, 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 all the way forward until they both hit the stops in the T-slot.
5. Check which way the machine tracks.
6. Engage the parking brake, shut off the engine, and remove the key.
7. Adjust the stop plates as needed.
   - If the machine tracks to the right, loosen the bolts and adjust the left stop plate rearward on the left T-slot until the machine tracks straight (Figure 50).
   - If the machine tracks to the left, loosen the bolts and adjust the right stop plate rearward on the right T-slot until the machine tracks straight (Figure 50).
8. Tighten the stop plate (Figure 50).

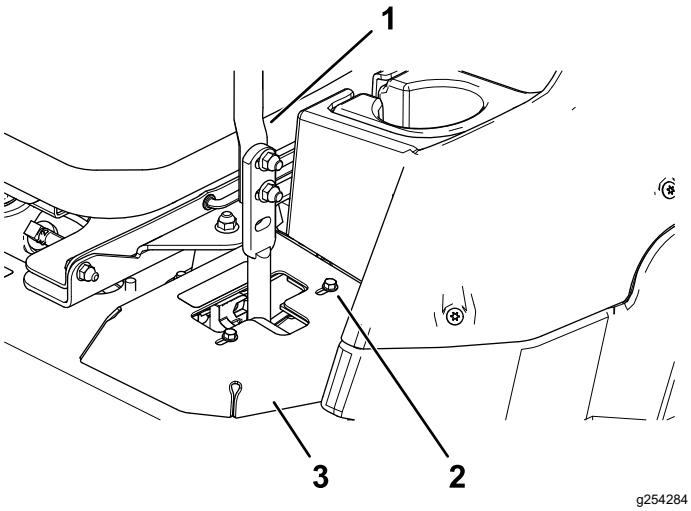


Figure 50

1. Control lever
2. Bolt
3. Stop plate

9. Align the levers in the front-to-rear position by bringing the levers together to the NEUTRAL position, and slide them until they are aligned, then tighten the bolts (Figure 51).

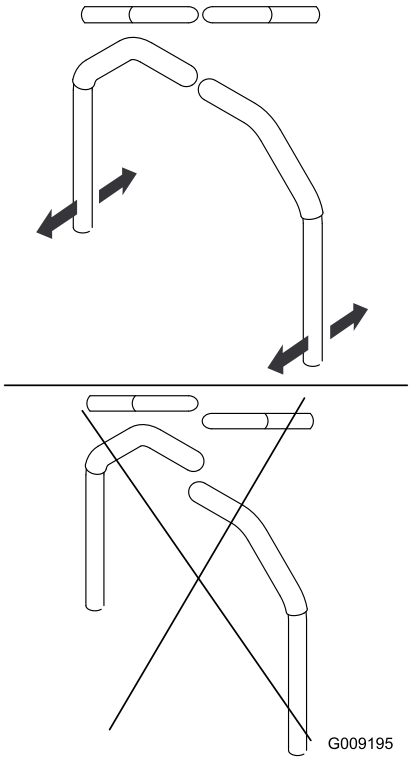


Figure 51

10. If alignment is needed, loosen the 2 motion-control lever mounting bolts on the misaligned side (Figure 52).

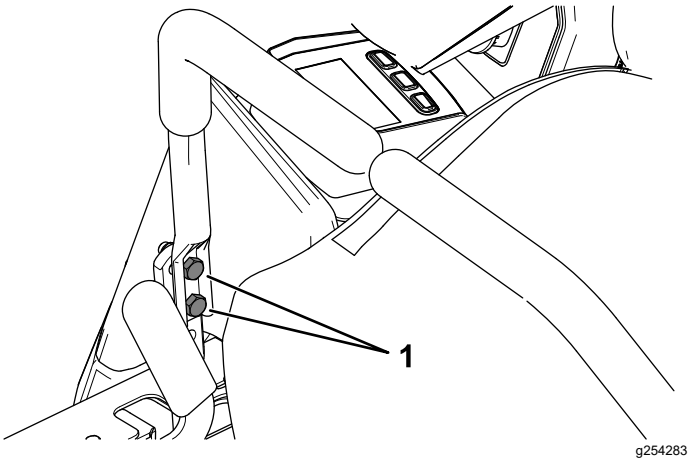


Figure 52

11. Move motion-control lever to meet the opposite side.
12. Tighten the 2 motion-control lever mounting bolts (Figure 52).

Checking the Tire Pressure

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

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

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

⚠ DANGER

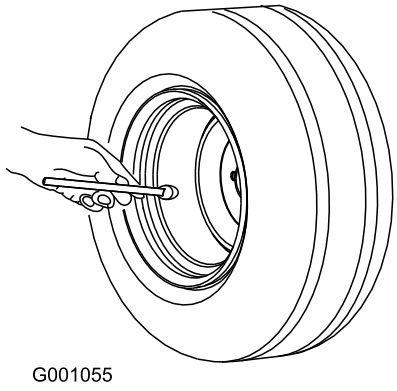
Low tire pressure decreases machine side-hill stability. This could cause a rollover, which may result in personal injury or death.

Do not under-inflate the tires.

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

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

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



g001055

Figure 53

Checking the Wheel Lug Nuts

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

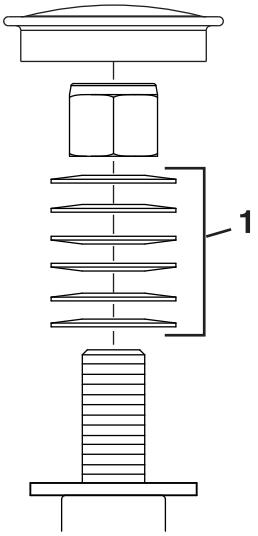
Torque the wheel lug nuts to 115 to 142 N·m (85 to 105 ft-lb).

Adjusting the Caster-Pivot Bearing

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

1. Park the machine on a level surface, disengage the blade-control switch, and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Remove the dust cap from the caster and tighten the locknut (Figure 54).
4. Tighten the locknut until the spring washers are flat, and then back off a 1/4 turn to properly set the preload on the bearings (Figure 54).

   Important: **Make sure that the spring washers are installed correctly as shown in Figure 54.**
5. Install the dust cap (Figure 54).



g228558

Figure 54

1. Spring disc washers

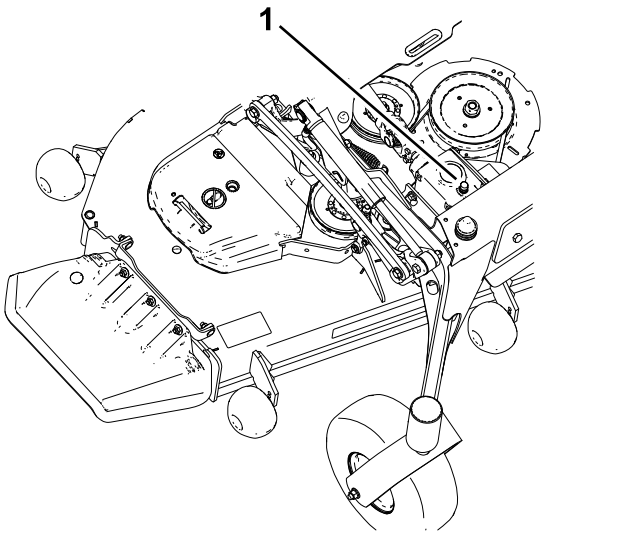
Servicing the Gearbox

Checking the Gearbox-Oil Level

Service Interval: Every 50 hours

Use SAE 75W-90 synthetic gear lube.

1. Park the machine on a level surface and engage the parking brake.
2. Lower the mower deck to the 25 mm (1 inch) height of cut.
3. Disengage the blade-control switch, shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
4. Lift the footrest to expose the top of the mower deck.
5. Remove the dipstick/fill plug from the top of the gearbox and ensure that the lubricant is between the marks on the dipstick (Figure 55).



g231764

Figure 55

1. Fill plug/dipstick

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

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

Changing the Gearbox Oil

Service Interval: After the first 200 hours

Every 400 hours

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

1. Park the machine on a level surface and engage the parking brake.
2. Lower the mower deck to the 25 mm (1 inch) height of cut.
3. Disengage the blade-control switch, shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
4. Lift the footrest to expose the top of the mower deck.
5. Remove the dipstick/fill plug from the top of the gearbox and ensure that the lubricant is between the marks on the dipstick (Figure 55).
6. Extract the oil through the fill port using a vacuum device or remove the gearbox from the deck and pour out the oil into a drain pan.
7. Install the gearbox (if it was removed to drain).
8. Add approximately 420 ml (14 fl oz), until the level is between the marks on the dipstick

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

Cooling System Maintenance

Cooling System Safety

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

Checking the Engine-Coolant Level

Service Interval: Before each use or daily

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

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

1. 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. Open the hood.
4. Check the level of the coolant in the expansion tank (Figure 56).

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

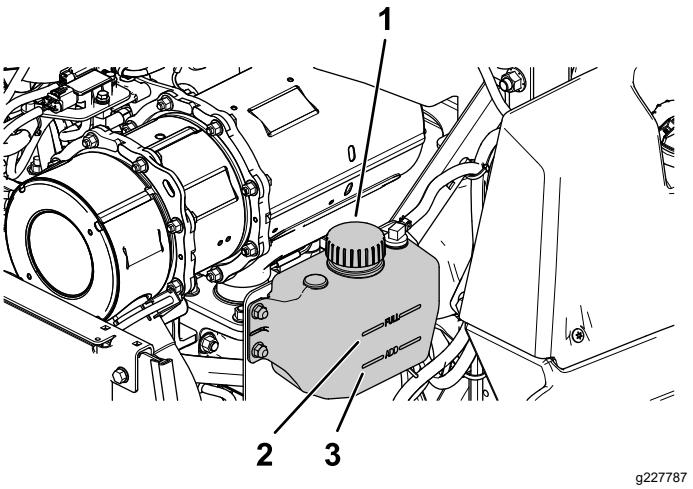


Figure 56

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

5. If coolant level is low, remove the expansion-tank cap, and add the specified coolant (Figure 56).

   Important: **Do not overfill.**
6. Install the expansion-tank cap.
7. Close the hood.

Cleaning the Radiator

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

Clean the radiator to prevent the engine from overheating.

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

1. Park the machine on a level surface, disengage the blade-control switch, and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Rotate the hood forward.
4. Using compressed air, blow out debris stuck between the fins of the entire radiator, both from the top down and bottom up.
5. If debris remains, it may be necessary to use water from a low-pressure hose.

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

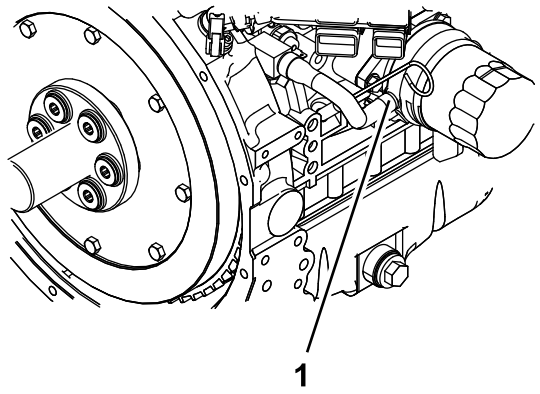
Note: If debris remains, repeat until clean.

7. Lower the hood.
8. Start the engine to ensure that the fan functions properly.

Changing the Engine Coolant

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

1. Park the machine on a level surface, disengage the blade-control switch, and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Rotate the hood forward.
4. Drain the coolant when the engine is cool.
5. Remove the radiator cap, place a pan under the radiator, and remove the drain plug at the bottom of the radiator.
6. Remove the coolant hose from the oil cooler and drain the coolant from the engine block (Figure 57).



g233651

Figure 57

1. Coolant hose

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

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

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

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

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

Brake Maintenance

Adjusting the Parking Brake

Service Interval: After the first 100 hours

Every 400 hours

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

1. Park the machine on a level surface, disengage the blade-control switch, and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Raise the rear of the machine up and support the machine with jack stands.
4. Remove the rear tires from the machine.
5. Remove any debris from the brake area.
6. Release the drive wheels; refer to Using the Drive-Wheel Release Valves (page 34).
7. Measure the length of the link assembly (Figure 58).

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

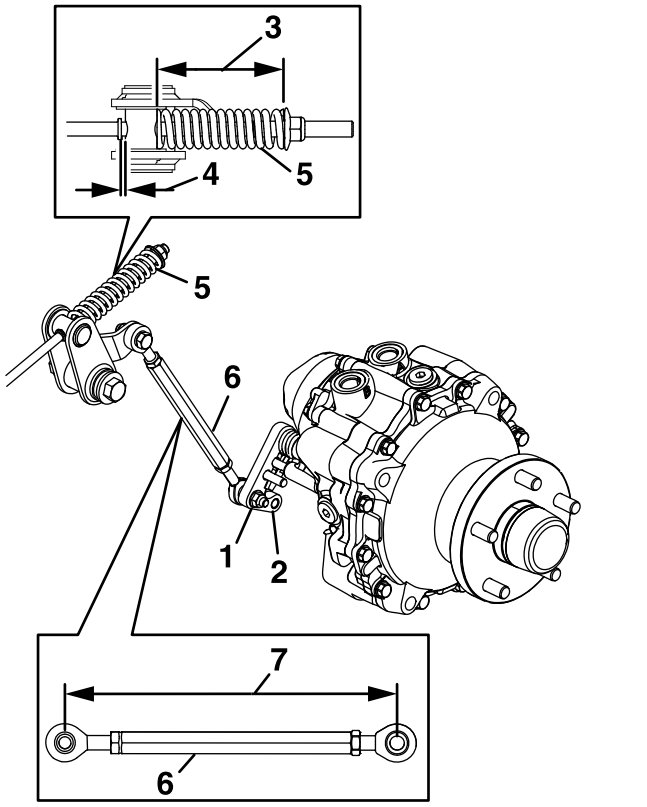


Figure 58

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

8. Measure the length of the spring (Figure 58).

   Note: The measurement should be 95 mm (3-3/4 inches).
9. When you achieve the correct spring length, check to see if there is a visible gap between the trunion and the shoulder.
10. Disengage the parking brake and turn the wheel hub by hand in both directions.

    Note: The wheel hub should move freely.
11. If a gap is needed or the wheel hub does move freely, do the following:

    A. Disengage the parking brake.

    B. Disconnect and fine-tune the rear linkage assembly.

    - Shorten the link to create a gap.
    - Lengthen the link to allow wheel hub movement.

    C. Connect the rear linkage assembly.
12. Engage the parking brake and check the gap.

13. Repeat steps 10 through 12 until a visible gap is achieved and the wheel hub rotates freely. Repeat this procedure for the other side.

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

14. Rotate the drive wheel release handle to the operating position; refer to Using the Drive-Wheel Release Valves (page 34).

15. Install the rear tires and torque the lug nuts to 115 to 142 N·m (85 to 105 ft-lb).

16. Remove the jack stands.

Belt Maintenance

Inspecting the Belts

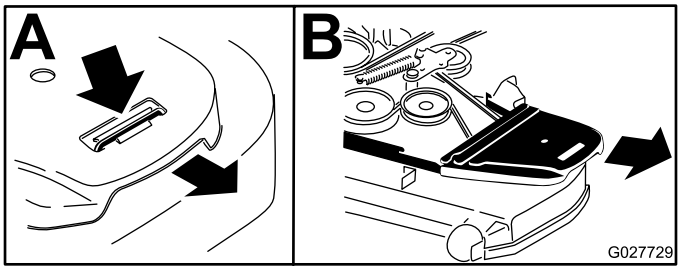
Service Interval: Every 50 hours

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

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

1. Park the machine on a level surface, disengage the blade-control switch, and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Lower the mower to the 76 mm (3 inches) height of cut.
4. Remove the belt covers (Figure 59).



g027729

Figure 59

5. Use a ratchet in the square hole in the idler arm to remove tension on the idler spring (Figure 60 or Figure 61).
6. Remove the belt from the mower-deck pulley.
7. Install the new belt around the mower pulleys (Figure 60 or Figure 61).

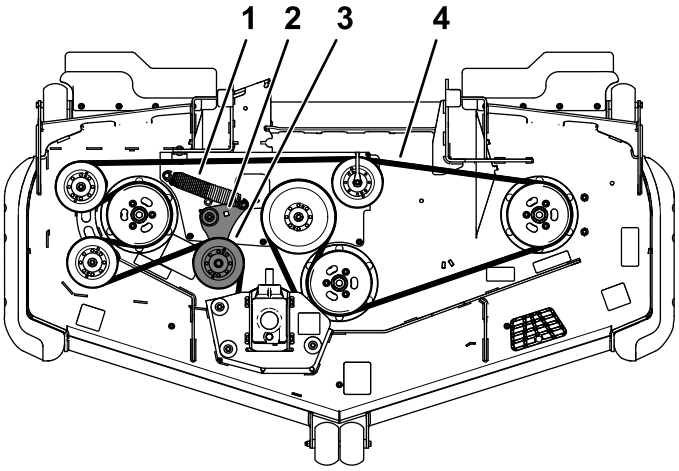


Figure 60

Rear Discharge Machine Shown

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

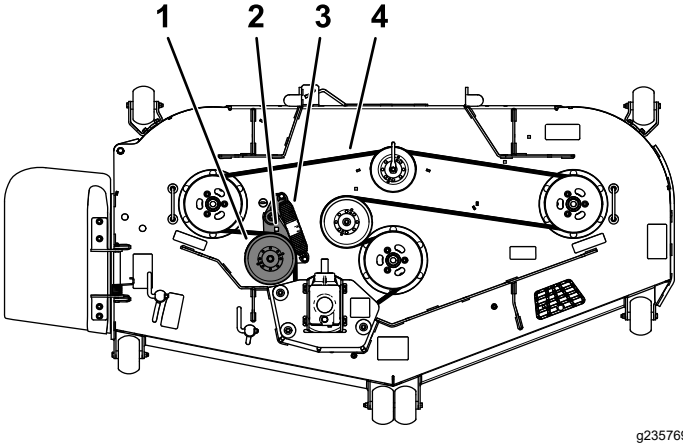


Figure 61

Side Discharge Machine Shown

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

8. Ensure that the spring ends are seated in the anchor grooves, and using the ratchet in the square hole, install the belt around the idler pulley (Figure 60 or Figure 61).
9. Install the belt covers (Figure 62).

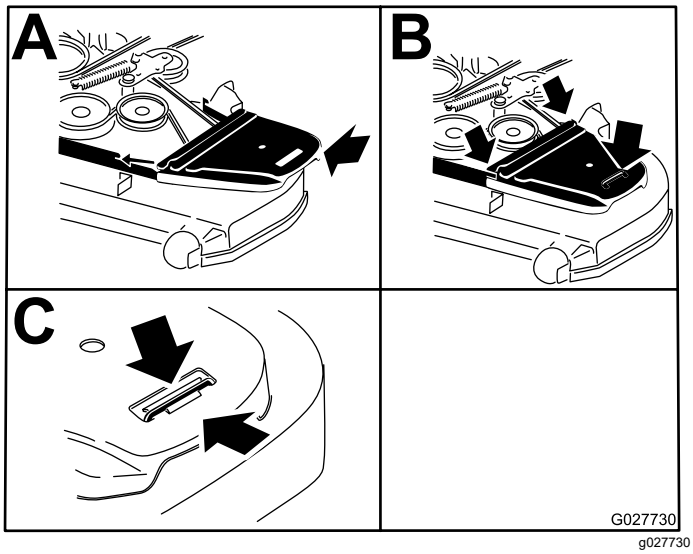


Figure 62

Checking the Alternator-Belt Tension

Service Interval: Every 100 hours

1. Apply 44 N (10 lb) of force to the alternator belt, midway between the pulleys.
2. If the deflection is not 10 mm (3/8 inch), loosen the alternator mounting bolts (Figure 63).

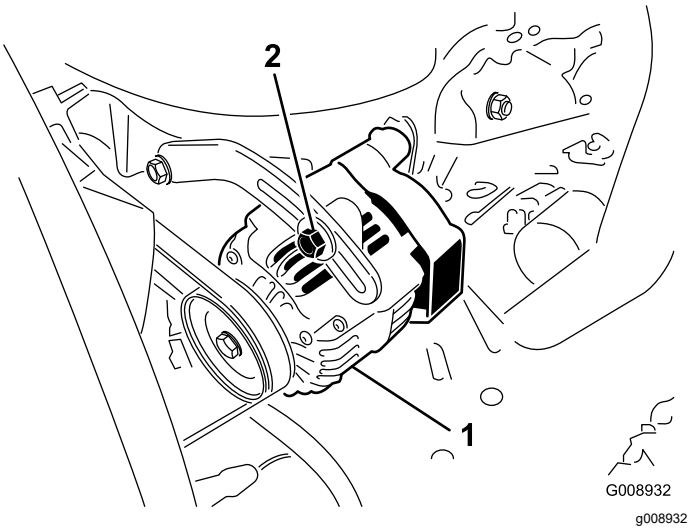


Figure 63

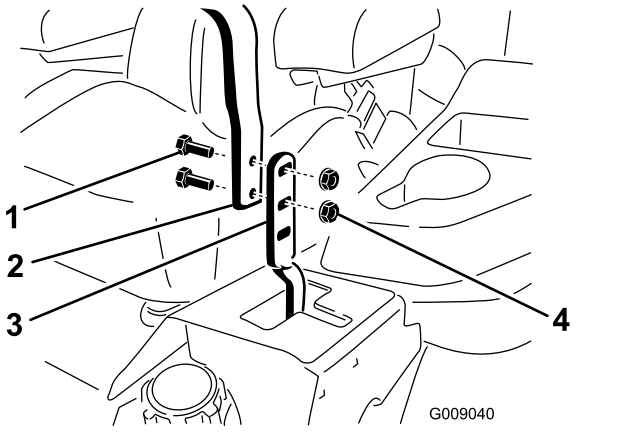
1. Mounting bolt
2. Alternator

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

Adjusting the Control-Handle Position

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

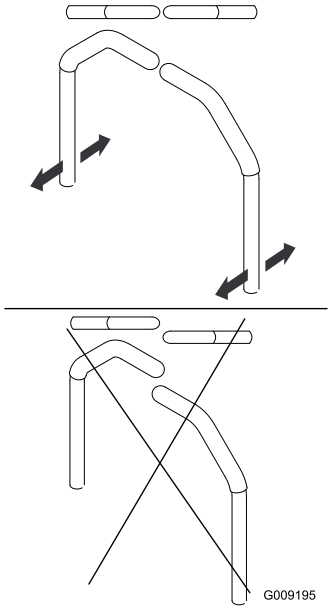
1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Loosen the bolts and flange nuts installed in the levers (Figure 64).
4. Align the levers in the front-to-rear position by bringing the levers together to the NEUTRAL position, and slide them until they are aligned, then tighten the bolts (Figure 65).



g009040

Figure 64

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



g009195

Figure 65

5. If the ends of the levers hit against each other, refer to Adjusting the Motion-Control Linkage (page 56).
6. Repeat to adjust the control levers.

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

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

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

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Push the deck-lift pedal, remove the height-of-cut pin, and lower the mower deck to the ground

4. Raise the rear of the machine up and support it with jack stands (or equivalent support) just high enough to allow the drive wheels to turn freely.
5. Remove the electrical connection from the seat safety switch, located under the bottom cushion of the seat.

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

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

   Note: The motion-control levers must be in neutral while you are making any adjustments.
9. Bring the motion-control levers into the NEUTRAL position.
10. Adjust the pump control rod lengths by rotating the double nuts on the rod in the appropriate direction until the wheels slightly creep in reverse (Figure 66).

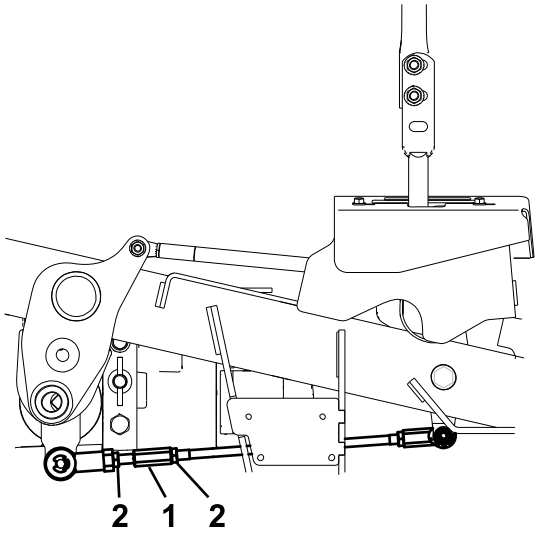


Figure 66

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

11. 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.
12. Shut off the machine.
13. Remove the jumper wire from the wire harness and plug the connector into the seat switch.
14. Remove the jack stands.
15. Raise the deck and install the height-of-cut pin.
16. Check and ensure that the machine does not creep in neutral with the parking brake disengaged.

Adjusting the Motion-Control Damper

You can adjust the top damper-mounting bolt to obtain the desired motion-control lever resistance. Refer to Figure 67 for mounting options.

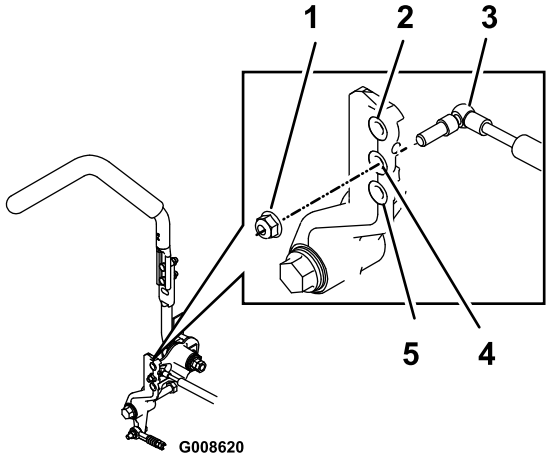


Figure 67

Right Motion Control Shown

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

Hydraulic System Maintenance

Hydraulic System Safety

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

Servicing the Hydraulic System

Hydraulic-Fluid Specifications

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

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

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

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

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

Checking the Hydraulic-Fluid Level

Service Interval: Before each use or daily

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

1. Park the machine on a level surface, disengage the blade-control switch, and engage the parking brake.
2. Move the motion-control levers to the NEUTRAL-LOCK position and start the engine.

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

   Important: **Do not engage the PTO.**
3. Raise the deck to extend the lift cylinders, shut off the engine, and remove the key.
4. Raise the seat to access the hydraulic-fluid tank.
5. Remove the hydraulic-tank cap (Figure 68).

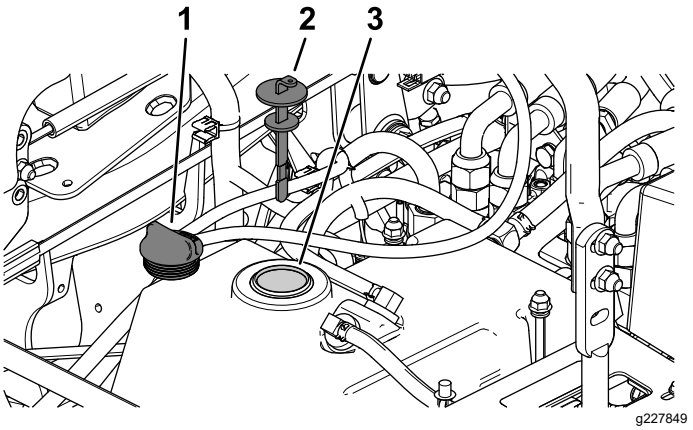


Figure 68

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

6. Remove the dipstick and wipe it with a clean rag (Figure 68).
7. Place the dipstick into the filler neck, remove it, and check the fluid level (Figure 69).

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

   Important: **Do not overfill.**

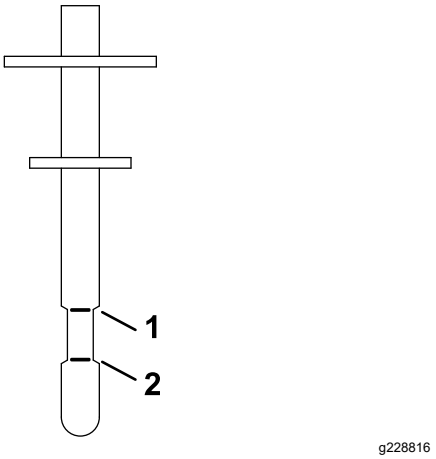


Figure 69

1. Full line
2. Add line

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

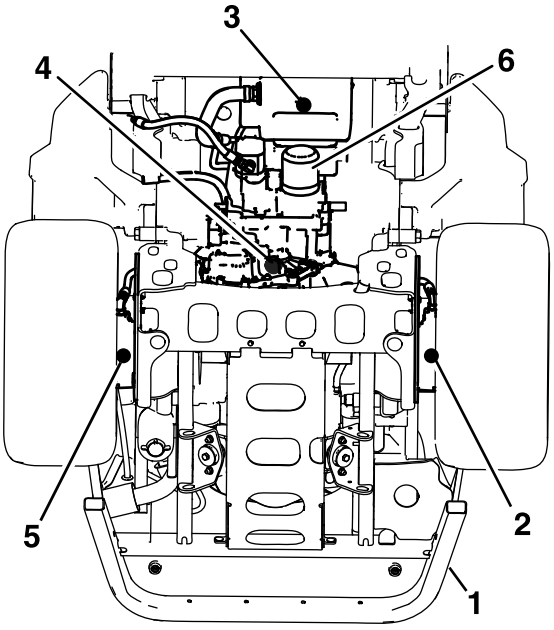
Changing the Hydraulic Fluid and Filter

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

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

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

1. Disengage the PTO, move the motion-control levers to the NEUTRAL-LOCK position, and engage the parking brake.
2. Move the throttle lever to the SLOW position, shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Raise the seat.
4. Place a large drain pan under the hydraulic reservoir, transmission case, and the left and right wheel motors (Figure 70).



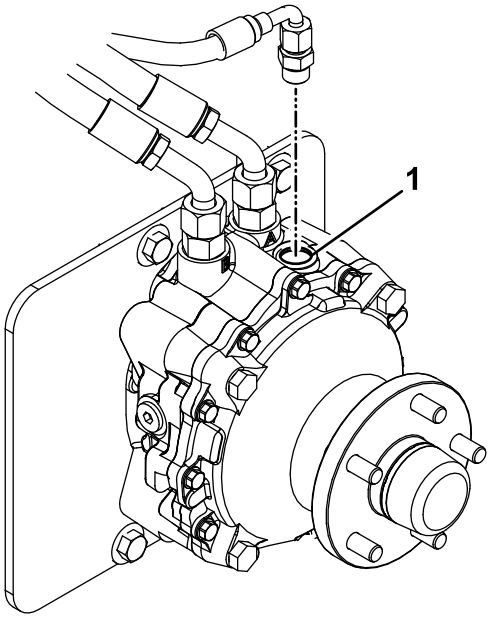
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Figure 70

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

5. Remove the drain plugs from each area and allow the hydraulic fluid to drain (Figure 70).
6. Clean the area around the hydraulic-fluid filter and remove the filter (Figure 70).
7. Install a new hydraulic-fluid filter and turn the filter clockwise until the rubber seal contacts the filter adapter, then tighten the filter an additional 2/3 to 3/4 turn.
8. Install the 4 drain plugs.

   Note: The wheel motor drain plugs are magnetic; wipe them clean before installing.
9. Remove the fill-port plug on the top of each wheel motor (Figure 71).
   A. Fill each wheel motor with approximately 1.4 L (1.5 US qt) of Toro Premium Transmission/Hydraulic Tractor Fluid.
   B. Install the fill-port plugs.



g235097

Figure 71

1. Fill port

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

    Allow the engine to run for about 5 minutes, then shut it off.
14. After 2 minutes, check the level of the hydraulic fluid; refer to Checking the Hydraulic-Fluid Level (page 58).

Mower Deck Maintenance

Blade Safety

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

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

Servicing the Cutting Blades

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

Before Inspecting or Servicing the Blades

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

Inspecting the Blades

Service Interval: Before each use or daily

1. Inspect the cutting edges (Figure 72).
2. If the edges are not sharp or have nicks, remove and sharpen the blade; refer to Sharpening the Blades (page 62).
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 72).

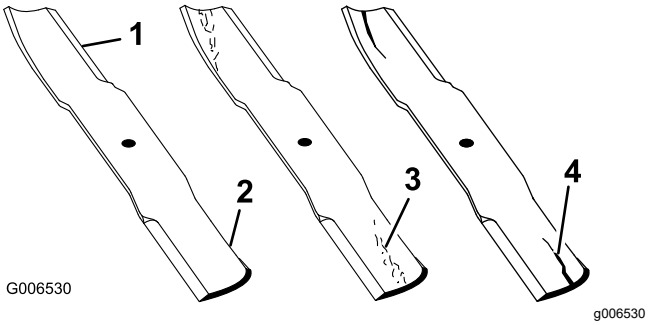


Figure 72

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 73).

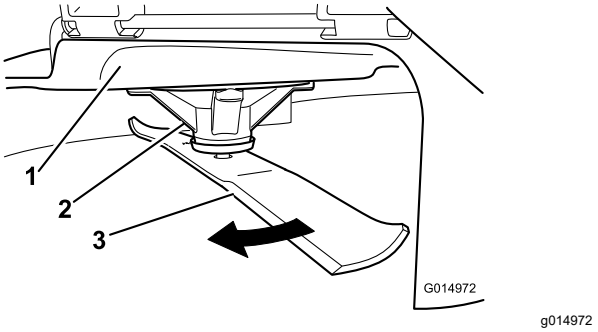
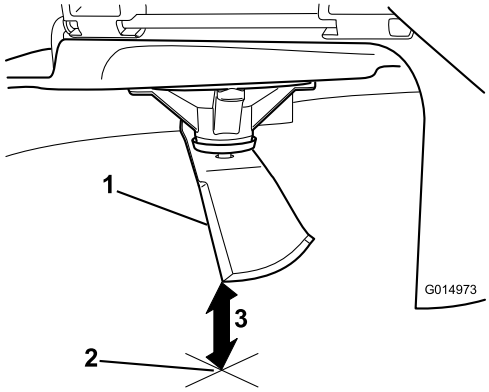


Figure 73

1. Deck
2. Spindle housing
3. Blade

3. Measure from the tip of the blade to the flat surface (Figure 74).

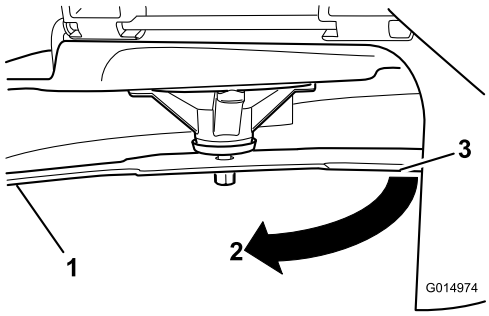


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Figure 74

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 75).



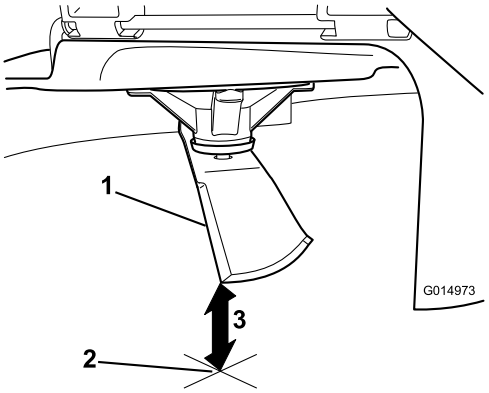
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Figure 75

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 76).

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



g014973

Figure 76

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 Removing the Blades (page 61) and Installing the Blades (page 62).

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

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

6. Repeat this procedure on each blade.

Removing the Blades

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

1. Place a wrench on the flat of the spindle shaft or hold the blade end using a rag or thickly padded glove.
2. Remove the blade bolt, bushing, and blade from the spindle shaft (Figure 77).

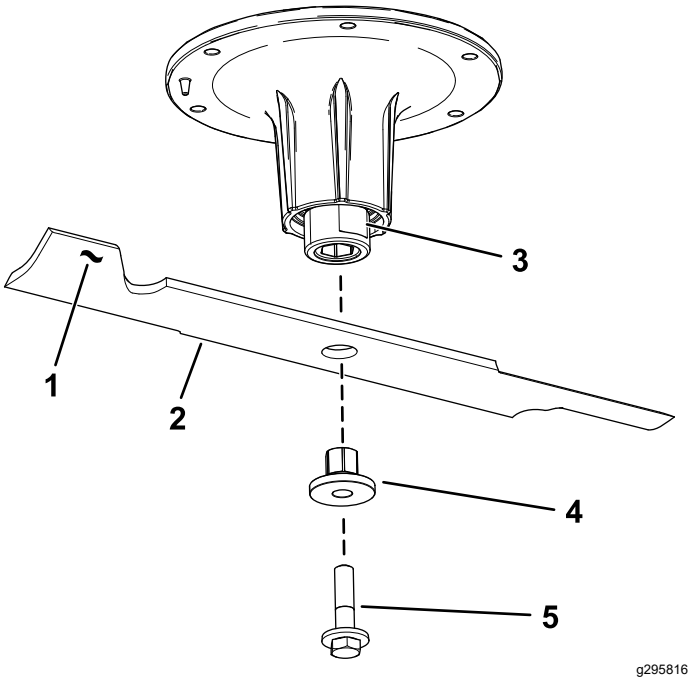


Figure 77

1. Sail area of the blade
2. Blade
3. Flat of the spindle shaft
4. Bushing
5. Blade bolt

Sharpening the Blades

1. Use a file to sharpen the cutting edge at both ends of the blade (Figure 78).

   Note: Maintain the original angle.

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

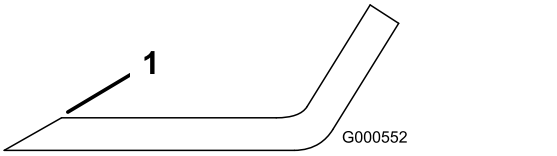


Figure 78

1. Sharpen at original angle.

2. Check the balance of the blade by putting it on a blade balancer (Figure 79).

   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 78).

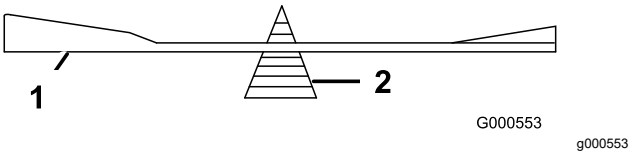


Figure 79

1. Blade
2. Balancer

3. Repeat this procedure until the blade is balanced.

Installing the Blades

1. Install the bushing through the blade with the bushing flange on the bottom (grass) side of the blade (Figure 80).

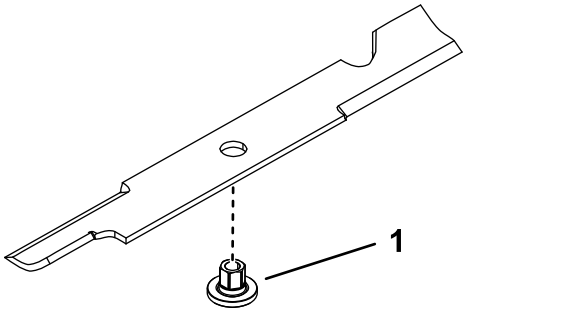


Figure 80

1. Bushing

2. Install the bushing/blade assembly into the spindle shaft (Figure 81).

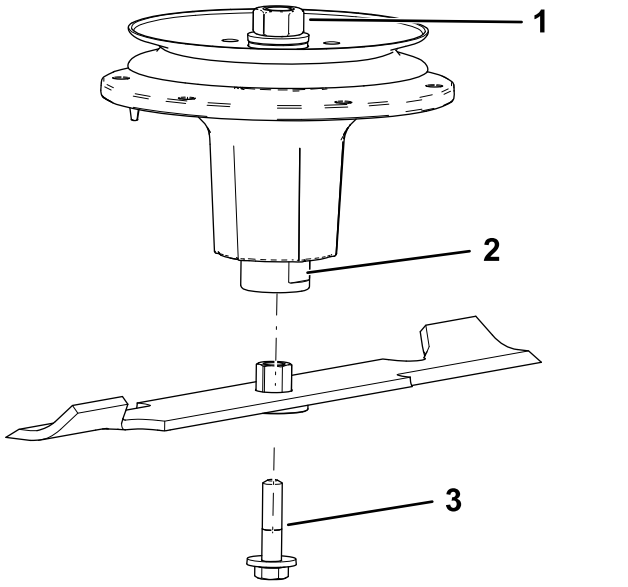


Figure 81

1. Top spindle nut
2. Flat of the spindle shaft
3. Blade bolt

3. Apply copper-based lubricant or grease to the threads of the blade bolt as needed to prevent seizing. Install the blade bolt finger-tight.
4. Place a wrench on the flat of the spindle shaft and torque the blade bolt to 75 to 81 N·m (55 to 60 ft-lb).

Leveling the Mower Deck

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

1. Park the machine on a level surface, disengage the blade-control switch, and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Check tire pressure of the drive tires.

   If needed, adjust to 124 kPa (18 psi).
4. Using the deck-lift switch, move the deck height out of the transport position (140 mm/5-1/2 inches cutting height).

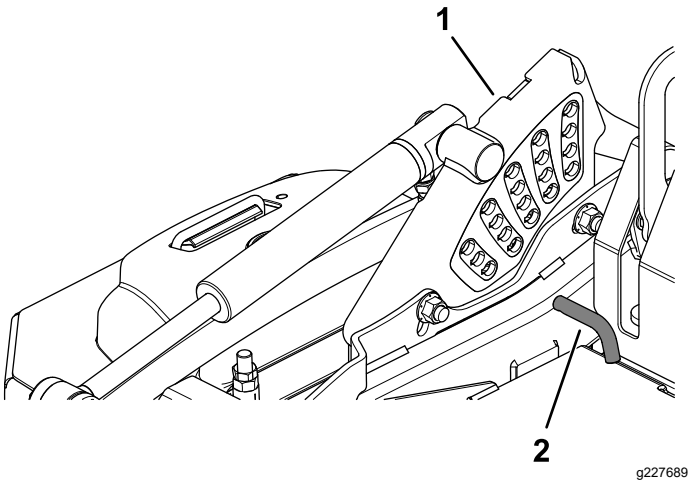


Figure 82

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

5. Insert the height-of-cut pin into the 76 mm (3 inches) height-of-cut location.
6. Release the transport lock and allow the deck to lower to the cutting height.
7. Raise the discharge deflector (side discharge mowers only).
8. Measure from the level surface to the front tip of the center blade (Figure 83).

   Note: The measurement should read 76 mm (3 inches).

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

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

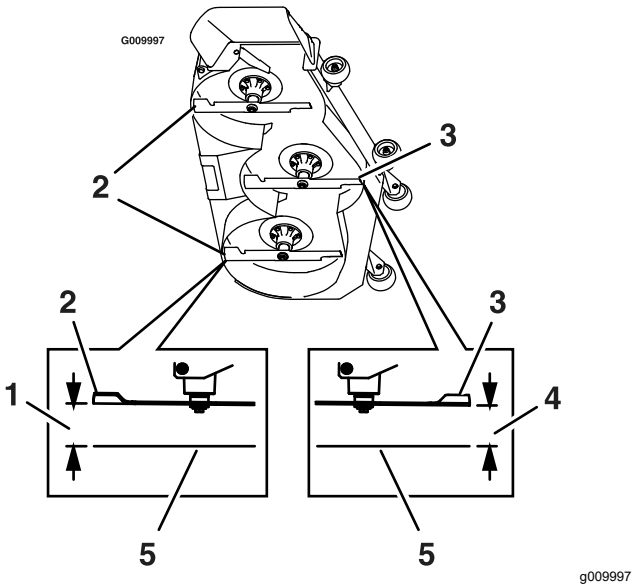


Figure 83

1. Side discharge: 83 mm (3-1/4 inches); rear discharge: 76 mm (3 inches).
2. Rear blade tip
3. Front blade tip
4. 76 mm (3 inches)
5. Level surface

9. Fine-tune the adjustment nut on the front deck lift assembly by turning it (Figure 84).

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

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

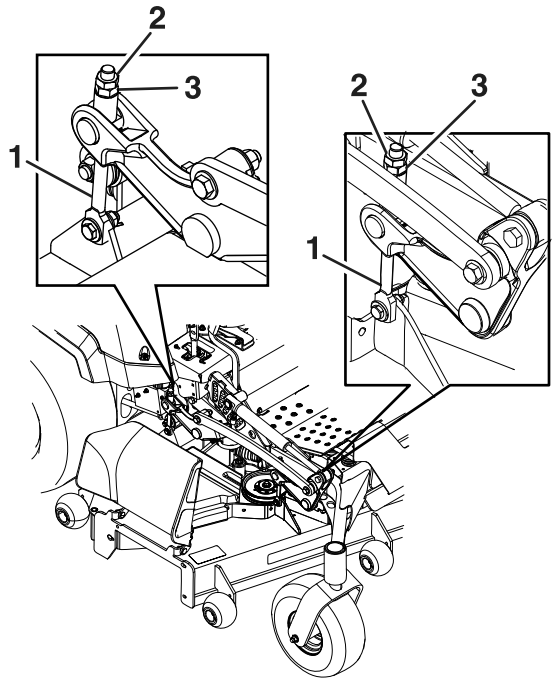


Figure 84

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

10. Measure the rear blade tip height. Fine-tune the rear adjusters as required; use the single-point adjustment to gain more adjustment.
    - **Side-Discharge Machines:** the rear tips of the side blades should measure 83 mm (3-1/4 inches).
    - **Rear-Discharge Machines:** the rear tips of the side blades should measure 76 mm (3 inches).
11. Measure until all 4 sides are the correct height. Tighten all the nuts on the deck-lift arm assemblies.
12. Lower the discharge deflector (side-discharge mowers only).
13. If the 4 deck adjusters do not have enough adjustment to achieve the accurate height of cut with the desired rake, you can adjust the single-point system (Figure 85).

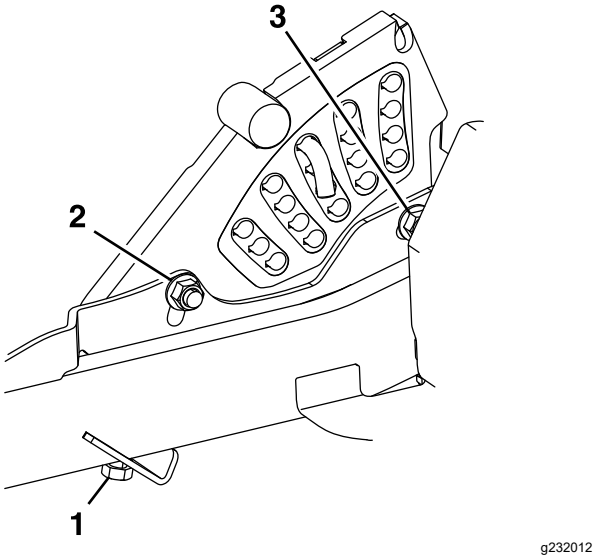


Figure 85

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

14. To adjust the single-point system, first loosen the front and rear height-of-cut plate mounting bolts (Figure 85).

    Note: Rear-Discharge Machines Only: The mower deck is attached in the front holes at the factory (Figure 86). If needed, use the back holes for further adjustment when leveling the mower deck.

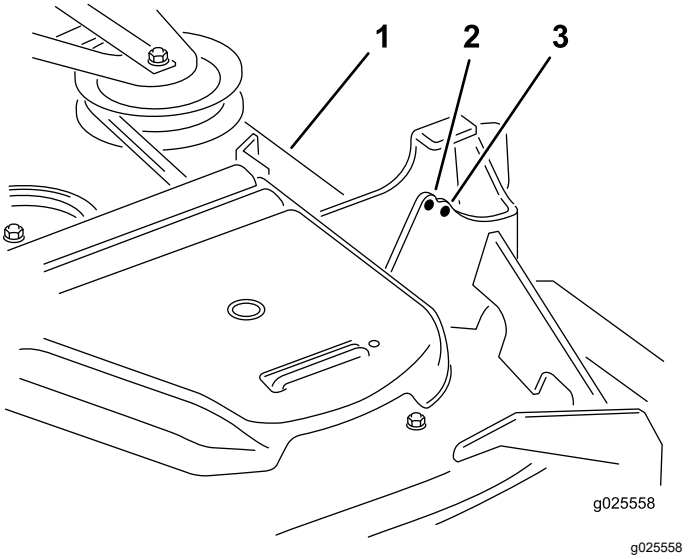


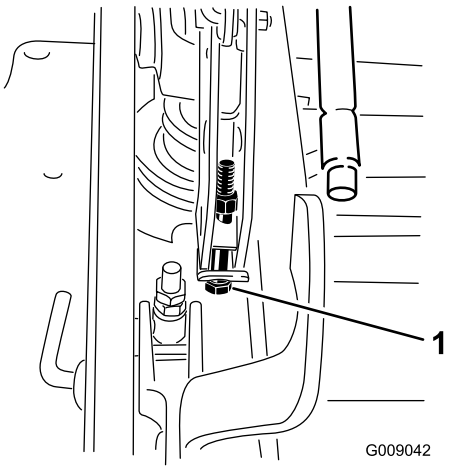
Figure 86

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

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

adjustment bolt by rotating it counterclockwise (Figure 87).

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



g009042

Figure 87

1. Single-point-adjustment bolt

16. Tighten the 2 bolts at the bottom of the height-of-cut plate (Figure 85).

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

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

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

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 88).
2. Remove the damaged or worn grass deflector (Figure 88).

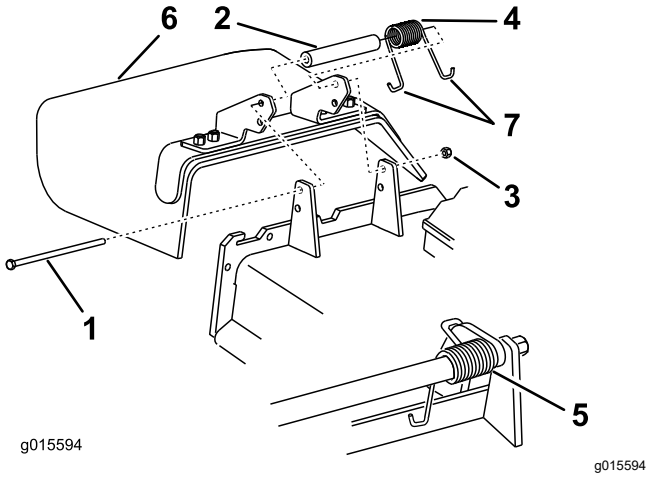


Figure 88

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 88.
5. Install the bolt and the nut.
6. Place 1 J-hook end of the spring around the grass deflector (Figure 88).

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

Cleaning

Cleaning the Engine and Exhaust System Area

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

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

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Clean around the flywheel, cylinder head, injectors, and injector pump.
4. Clean all debris from the exhaust system area.
5. Wipe up any excessive grease or oil around the engine and exhaust area.

Cleaning the Machine and Mower Deck

Service Interval: Before each use or daily

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Clean off any oil, debris, or grass build-up on the machine and mower deck, especially under the deck-belt shields, around the fuel tank, and around the engine and exhaust area.
4. Raise the mower deck to the TRANSPORT position.
5. Clean out any grass build-up from the underside of deck and in the discharge deflector.

Disposing of Waste

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

Storage

Storage Safety

- 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 Operating the Parking Brake (page 24).
5. Service the air cleaner; refer to Servicing the Air Cleaner (page 42).
6. Grease the machine; refer to Greasing the Machine (page 40).
7. Change the crankcase oil; refer to Servicing the Engine Oil (page 43).
8. Check the tire pressure; refer to Checking the Tire Pressure (page 49).
9. Change the hydraulic filters; refer to Changing the Hydraulic Fluid and Filter (page 59).
10. Charge the battery; refer to Charging the Battery (page 47).
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 60).
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.

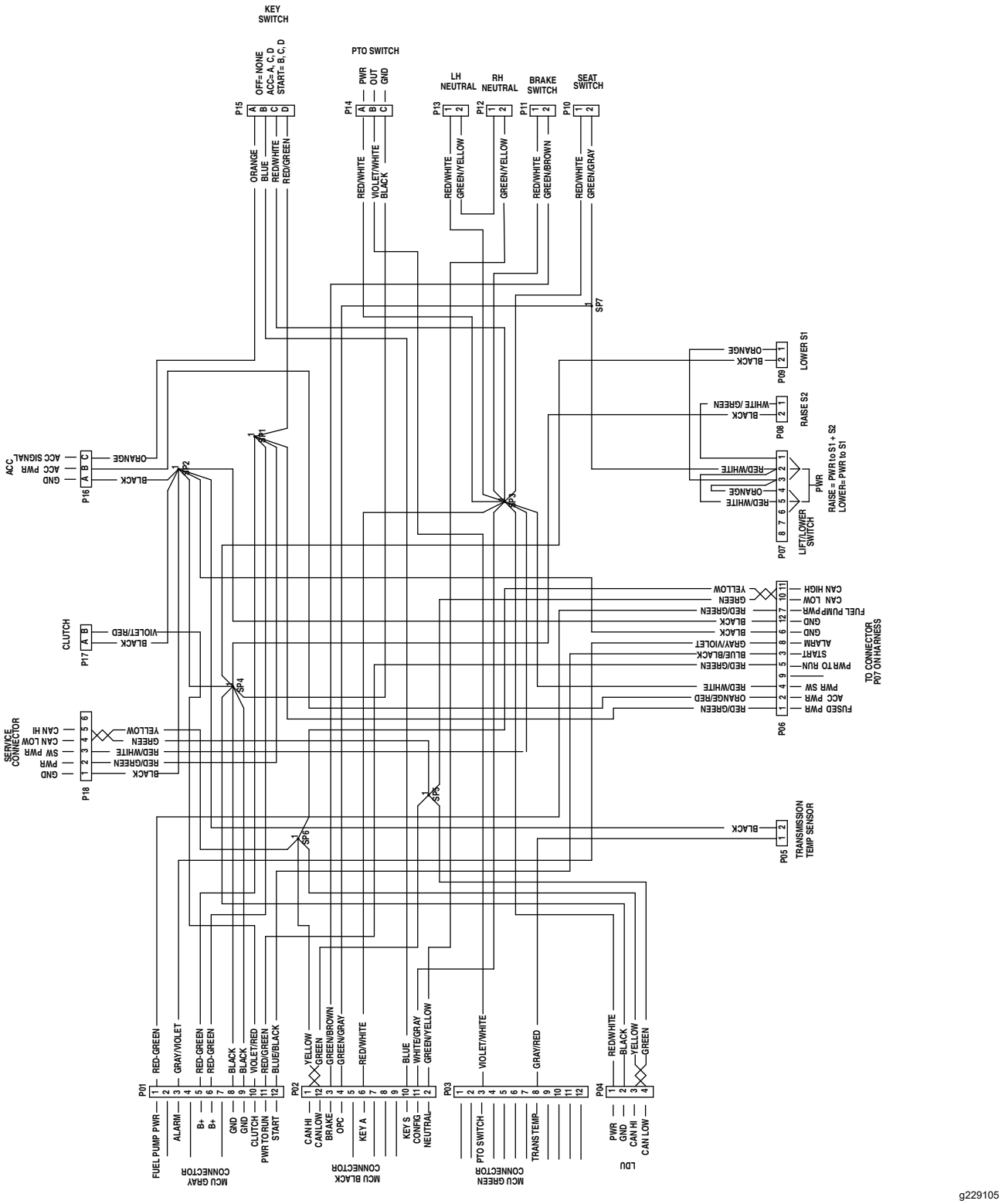
    Important: **Do not store fuel containing stabilizer/conditioner longer than the duration recommended by the fuel-stabilizer manufacturer.**
14. Check and tighten all bolts, nuts, and screws. Repair or replace any part that is damaged.
15. Paint all scratched or bare metal surfaces. Paint is available from your Authorized Service Dealer.
16. 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 starter does not crank.	1. The blade-control switch is engaged. 2. The parking brake is disengaged. 3. The motion-control levers are not in the NEUTRAL-LOCK position. 4. You are not sitting in the operator's seat. 5. The battery is dead. 6. The electrical connections are corroded or loose. 7. A fuse is blown. 8. A relay or switch is damaged.	1. Disengage the blade-control switch. 2. Engage the parking brake. 3. Move the motion-control levers outward to the NEUTRAL-LOCK position. 4. Sit on the operator's seat. 5. Charge the battery. 6. Check the electrical connections for good contact. 7. Replace the fuse. 8. Contact an Authorized Service Dealer.
The engine does not start, starts hard, or fails to keep running.	1. The fuel tank is empty. 2. The 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 fuel filter. 6. There is dirt, water, or stale fuel is in the fuel system. 7. The air cleaner is dirty. 8. The seat switch is not functioning properly. 9. The electrical connections are corroded, loose or faulty. 10. The relay or switch is broken.	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 needed. 9. Check the electrical connections for good contact. Clean the connector terminals thoroughly with electrical contact cleaner, apply dielectric grease, and connect. 10. Contact an Authorized Service Dealer.
The engine loses power.	1. The engine load is excessive. 2. The air cleaner is dirty. 3. The oil level in the crankcase is low. 4. The cooling fins and 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 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 machine pulls to the left or right (with the motion-control 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.

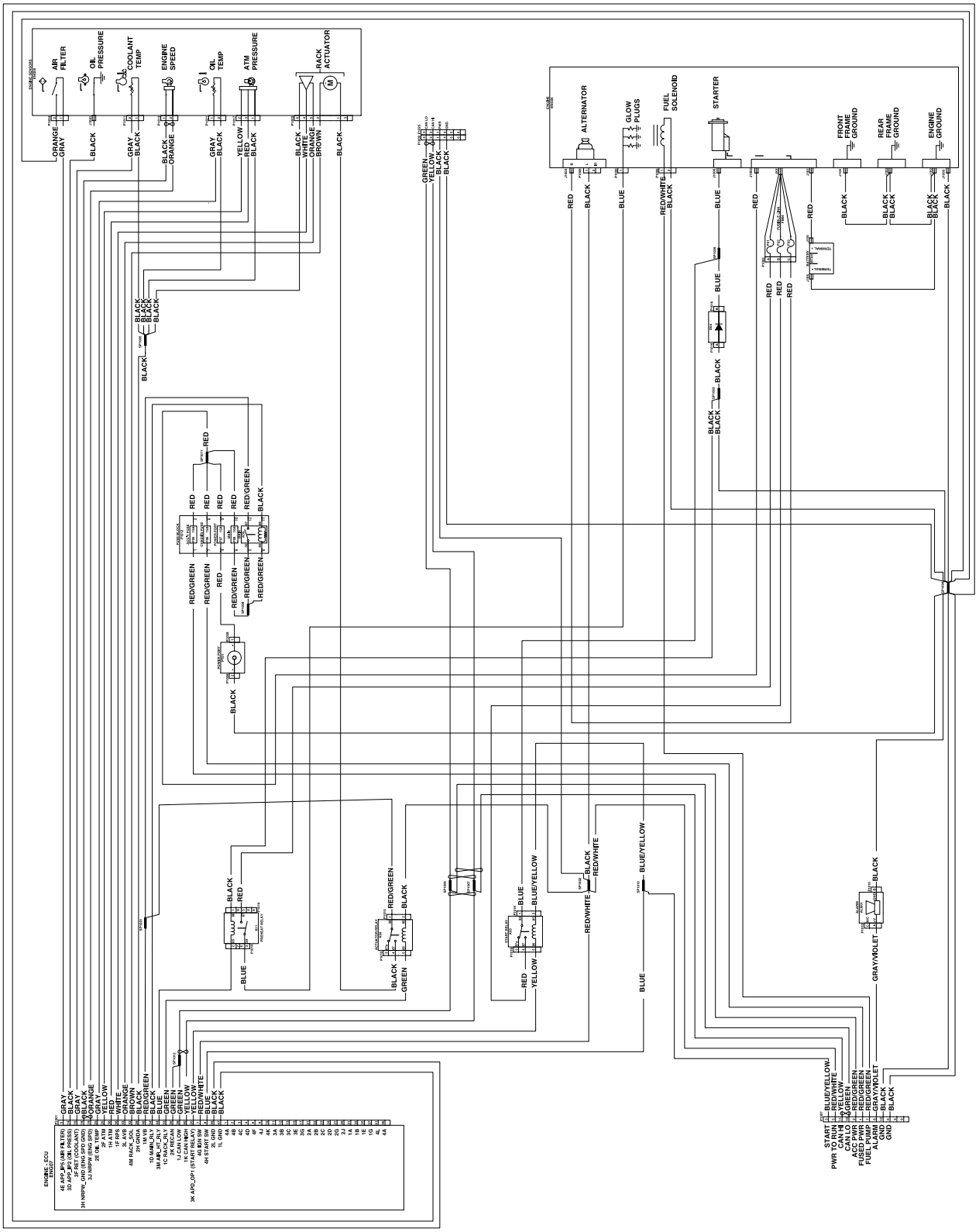
Problem	Possible Cause	Corrective Action
The machine does not drive.	1. The bypass valves are not closed tight. 2. The pump belt is worn, loose, or broken. 3. The pump belt is off a pulley. 4. The idler spring is broken or missing. 5. The hydraulic fluid level is low or too hot.	1. Tighten the bypass 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 mower deck belt is damaged, worn, loose, or broken. 2. The mower deck belt is off the pulley. 3. The pump drive belt is worn, loose, or broken. 4. The idler spring is broken or missing.	1. Install a new deck belt. 2. Install the mower belt on the deck pulley and check the idler pulley, idler arm, and spring for correct position and function. 3. Check the belt tension or install a new belt. 4. Replace the spring.

Schematics



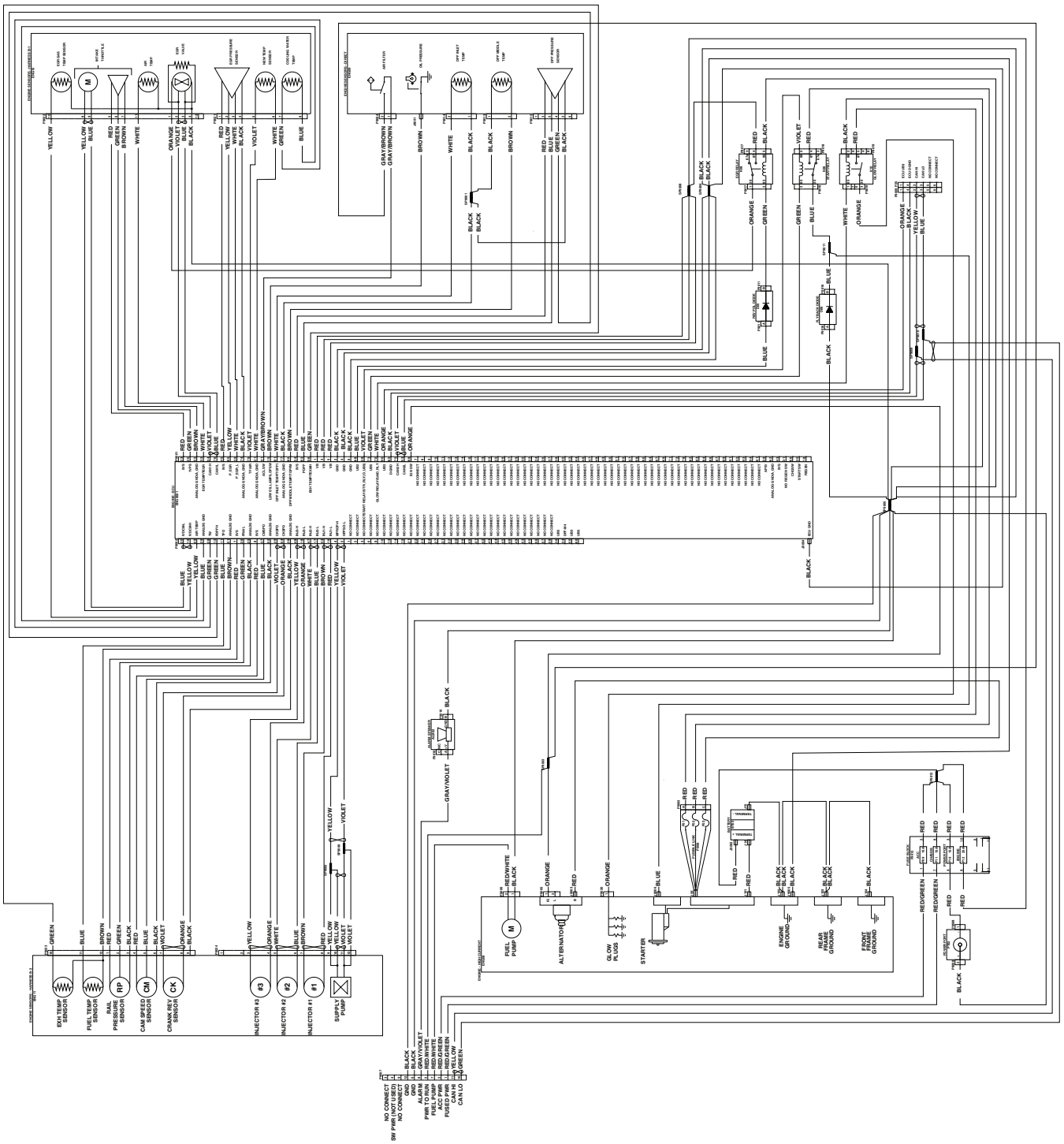
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Electrical Schematic—Machine with Horizon Display Monitor (Rev. A)



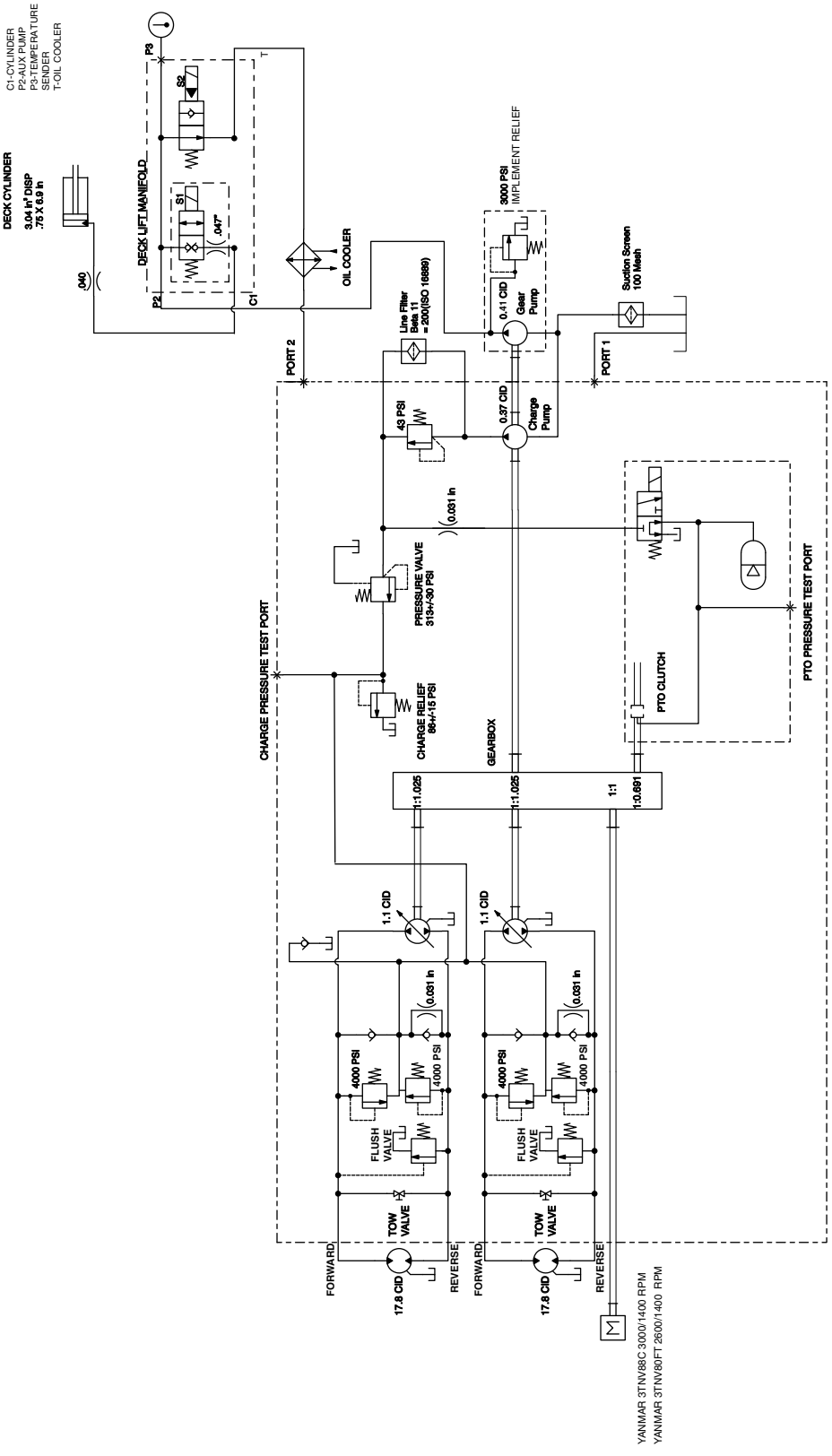
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Electrical Schematic—Yanmar Engine 3TNV80FT (Rev. B)



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



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Hydraulic Schematic (Rev. A)

California Proposition 65 Warning Information

What is this warning?

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



WARNING: Cancer and Reproductive Harm—www.p65Warnings.ca.gov.

What is Prop 65?

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

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

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

Does this law apply everywhere?

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

How do the California warnings compare to federal limits?

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

Why don't all similar products carry the warning?

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

Why does Toro include this warning?

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



Count on it.