Form No. 3462-744 Rev A

TORO®

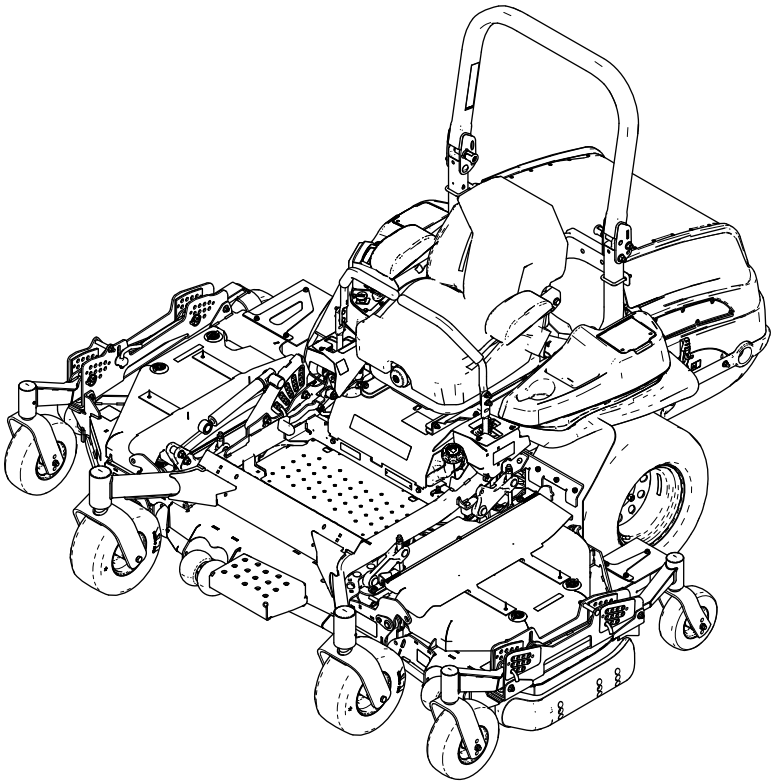
Count on it.

Operator's Manual

Air-Cooled Z Master® Professional Riding Mower

With 96in TURBO FORCE® Rear Discharge Mower

Model No. 74090—Serial No. 400000000 and Up



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

3462-744

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.

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.

⚠ WARNING

CALIFORNIA
Proposition 65 Warning

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

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

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

Introduction

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

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

Visit www.Toro.com 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.**

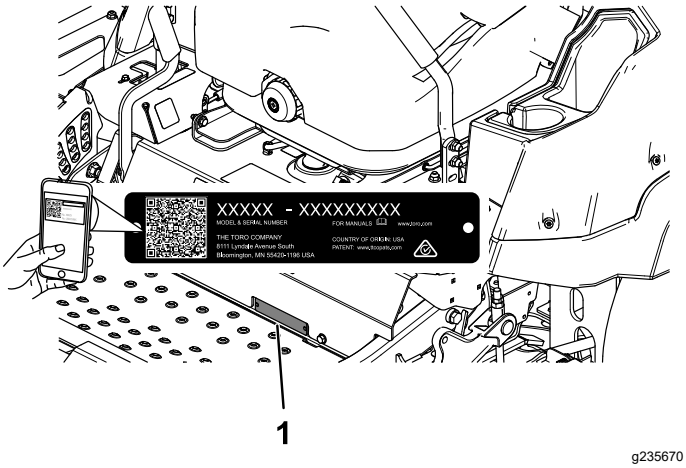


Figure 1

1. Model and serial number location

Model No. _____

Serial No. _____

8111 Lyndale Avenue South
Bloomington, MN 55420

Contact us at www.Toro.com.
Printed in the USA

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

The safety-alert symbol (Figure 2) appears both in this manual and on the machine to identify important safety messages that you must follow to avoid accidents. This symbol will appear with 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.

sa-black

Figure 2
Safety-alert symbol

Contents

Safety

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

General Safety

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

- Read and understand the contents of this *Operator's Manual* before starting the engine.
- Keep bystanders and children away.
- Do not allow children or untrained people to operate or service the machine. Allow only people who are responsible, trained, familiar with the instructions, and physically capable to operate or service the machine.
- 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°.
- Do not put your hands or feet near moving components of the machine.
- Do not operate the machine without all guards, safety switches, and other safety protective devices in place and functioning properly.
- Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operator's position. Allow the machine to cool before servicing, adjusting, fueling, cleaning, or storing it.

Slope Indicator

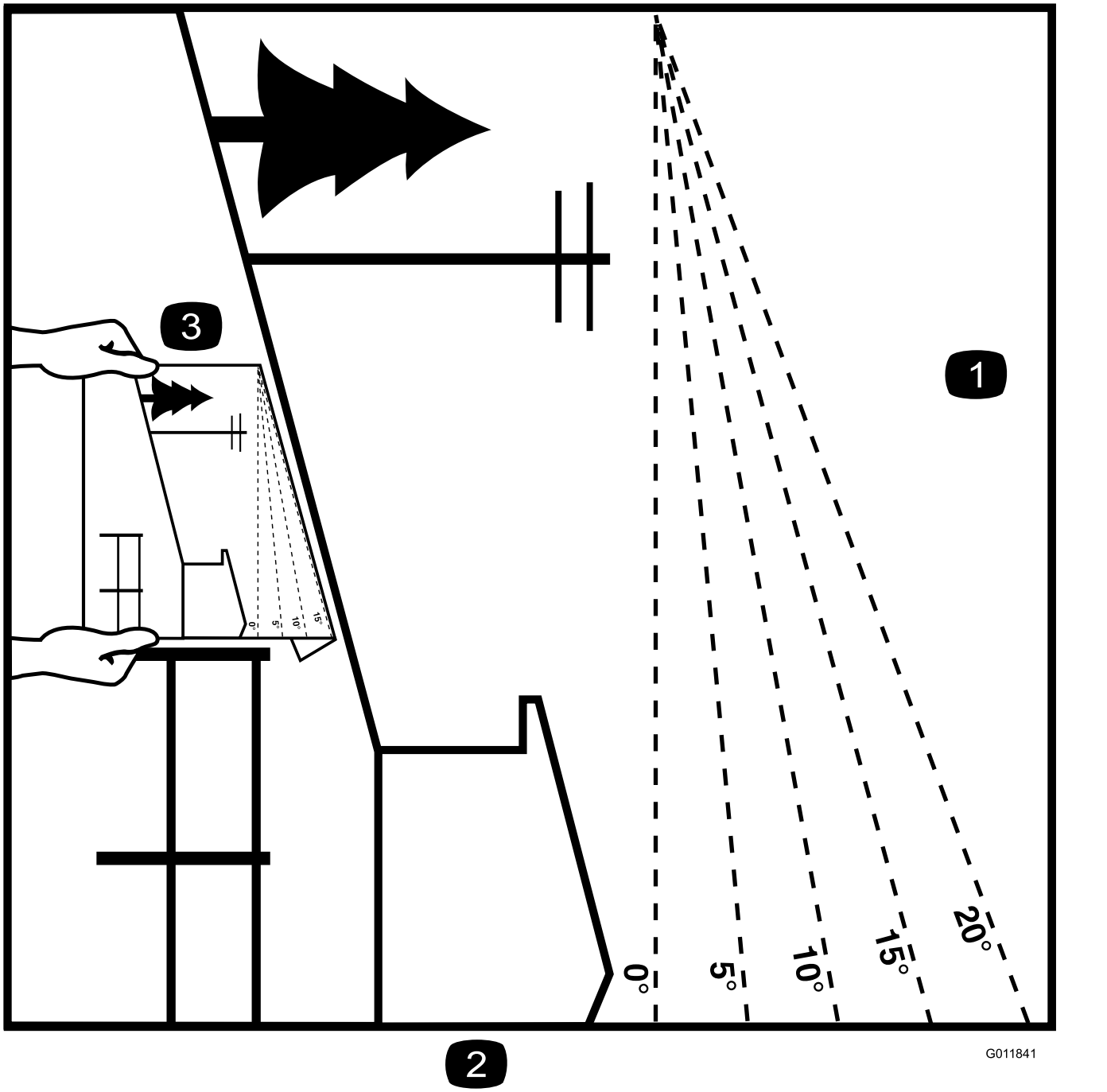


Figure 3

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

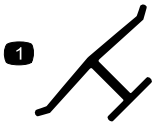
Safety decals and instructions are easily visible to the operator and are located near any area of potential danger. Replace any decal that is damaged or missing.

decalbatterysymbols

Battery Symbols

Some or all of these symbols are on your battery.

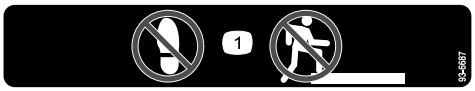
1. Explosion hazard
2. No fire, open flame, or smoking
3. Caustic liquid/chemical burn hazard
4. Wear eye protection.
5. Read the *Operator's Manual*.
6. Keep bystanders away from the battery.
7. Wear eye protection; explosive gases can cause blindness and other injuries.
8. Battery acid can cause blindness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



decaloemmarkt

Manufacturer's Mark

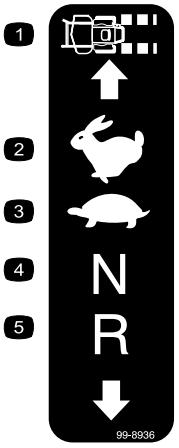
1. Indicates the blade is identified as a part from the original machine manufacturer.



decal93-6687

93-6687

1. Do not step here.



decal99-8936

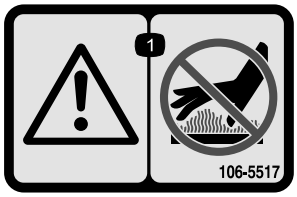
99-8936

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

decal106-2655

106-2655

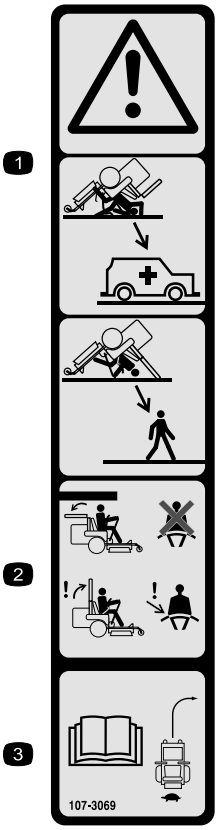
1. Warning—do not touch or approach moving belts; remove the key and read the instructions before servicing or performing maintenance.



decal106-5517

106-5517

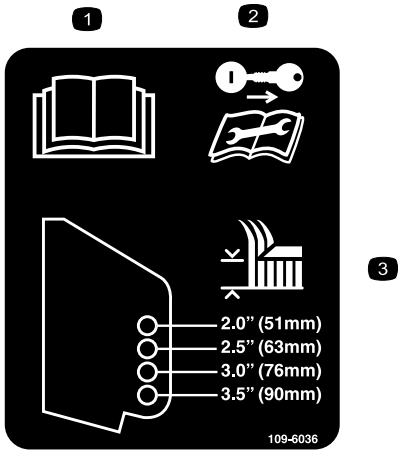
1. Warning—do not touch the hot surface.



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.

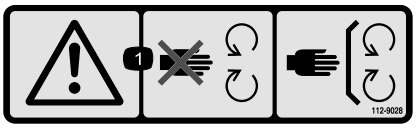


decal109-6036

109-6036

Rear Discharge Machines Only

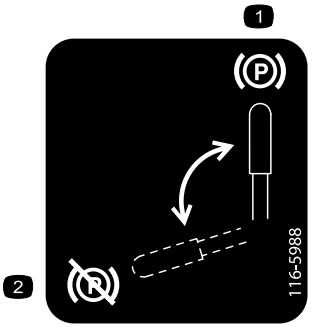
1. Read the *Operator's Manual*.
2. Remove the key and read the instructions before servicing or performing maintenance.
3. Height of cut



decal112-9028

112-9028

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



decal116-5988

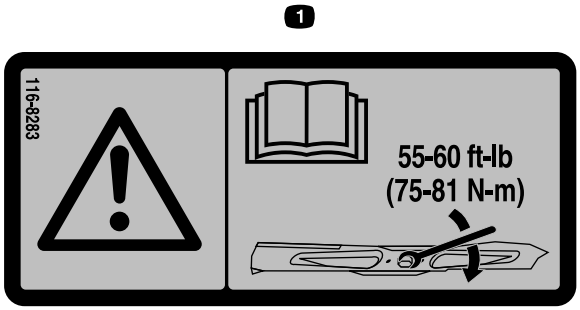
116-5988

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

decal116-8726

116-8726

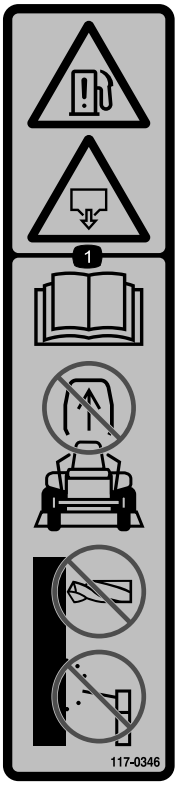
1. Read the *Operator's Manual* for the recommended hydraulic fluid.



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).



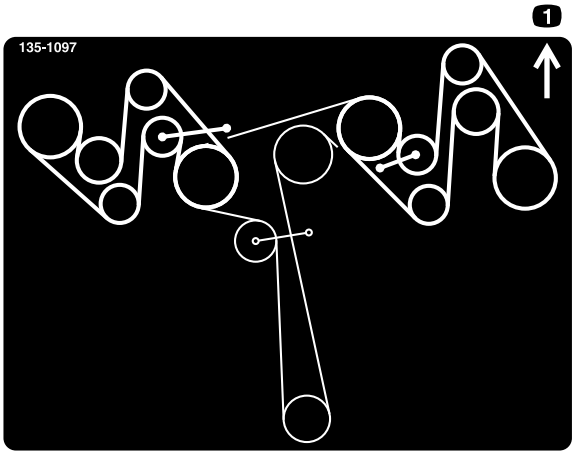
decal117-0346

117-0346

1. Fuel leak hazard—read the *Operator's Manual*; do not attempt to remove the roll bar; do not weld, drill or modify the roll bar in any way.

decal133-8062

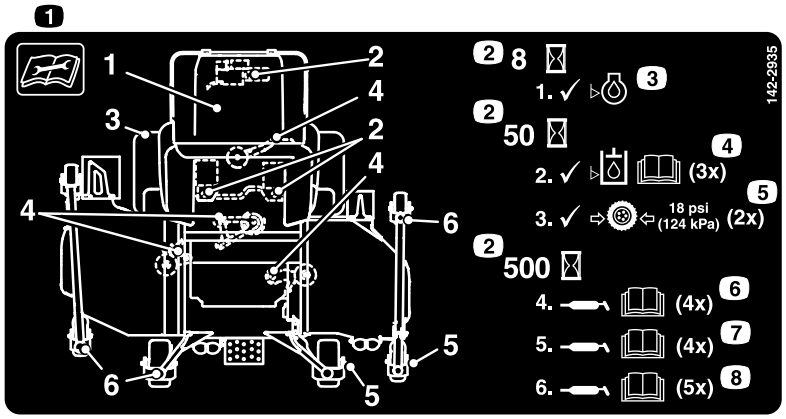
133-8062



decal135-1097

135-1097

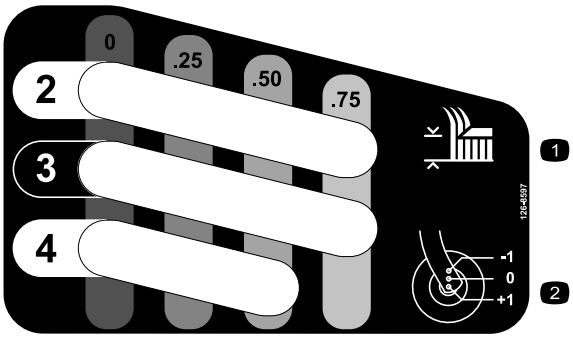
1. Belt routing



decal142-2935

142-2935

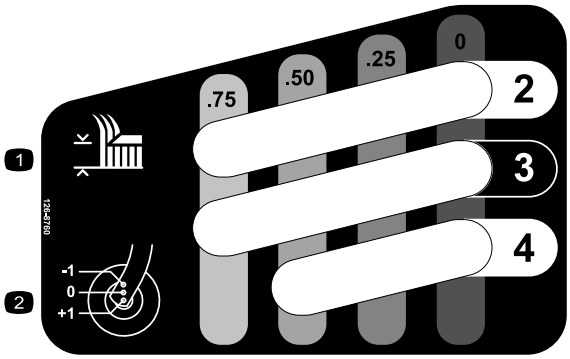
1. Read the instructions before servicing or performing maintenance.
2. Time interval
3. Check the engine-oil level.
4. Check the hydraulic-fluid level; refer to the Operator's Manual for further instructions (3 locations).
5. Check the tire pressure (2 locations).
6. Grease the idler pivots; refer to the Operator's Manual for further instructions (4 locations).
7. Grease the front caster wheel bearings; refer to the Operator's Manual for further instructions (4 locations).
8. Grease the caster pivots and gage wheel pivot bearings; refer to the Operator's Manual for further instructions (5 locations).



decal126-8597

126-8597

1. Height of cut
2. Range adjustment

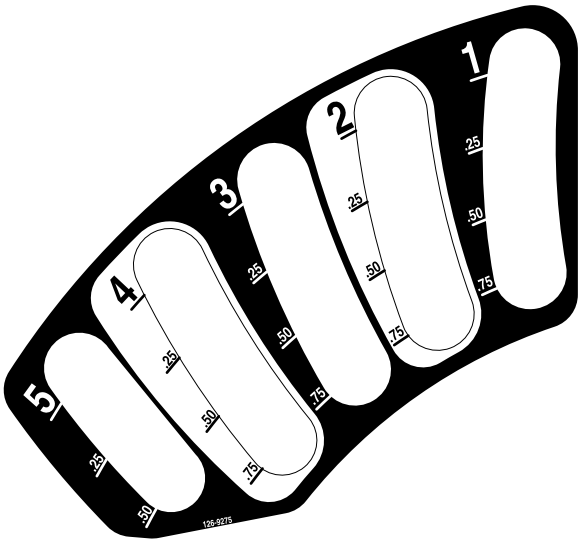


decal126-8760

126-8760

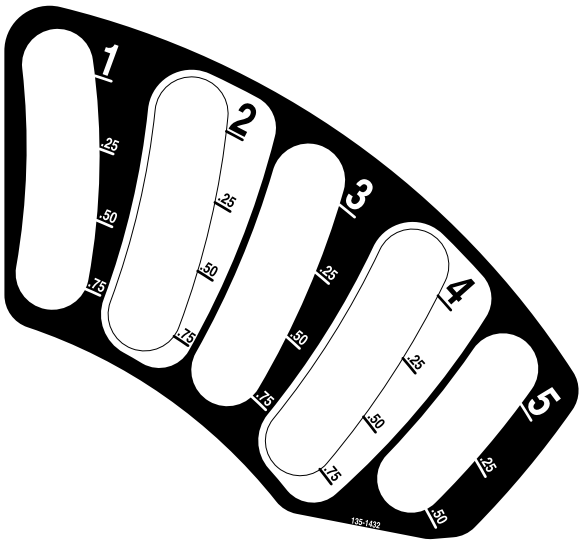
For Models with 244 cm (96-inch) Decks

1. Height of cut
2. Range adjustment



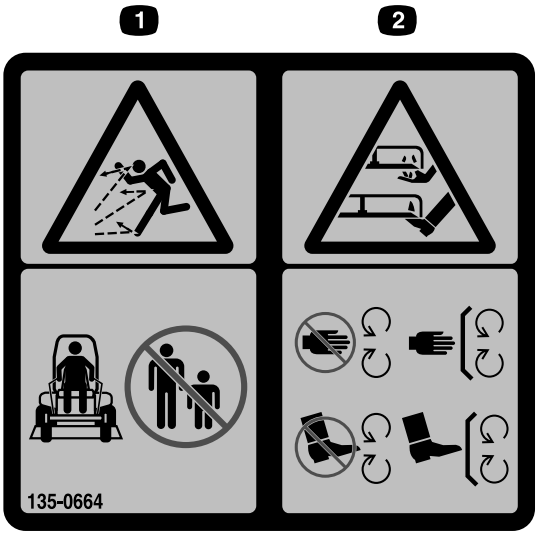
decal126-9275

126-9275



decal135-1432

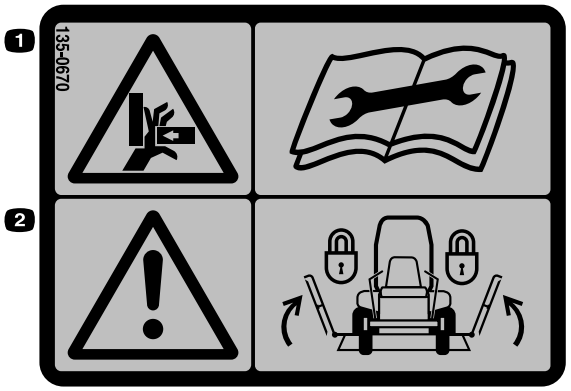
135-1432



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.

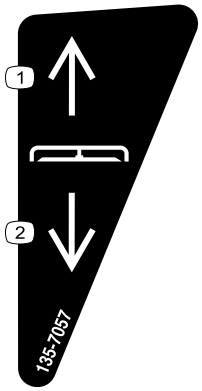


decal135-0670

135-0670

For Models with 244 cm (96-inch) Decks

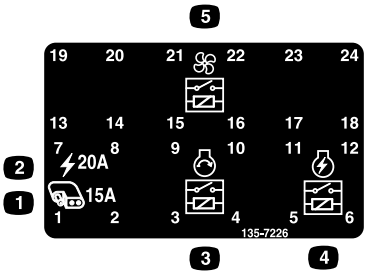
1. Crushing hazard, hand—read the instructions before servicing or performing maintenance.
2. Warning—lock the deck wings and read the instructions before servicing or performing maintenance.



decal135-7057

135-7057

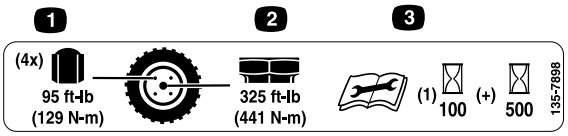
1. Deck—raise
2. Deck—lower



decal135-7226

135-7226

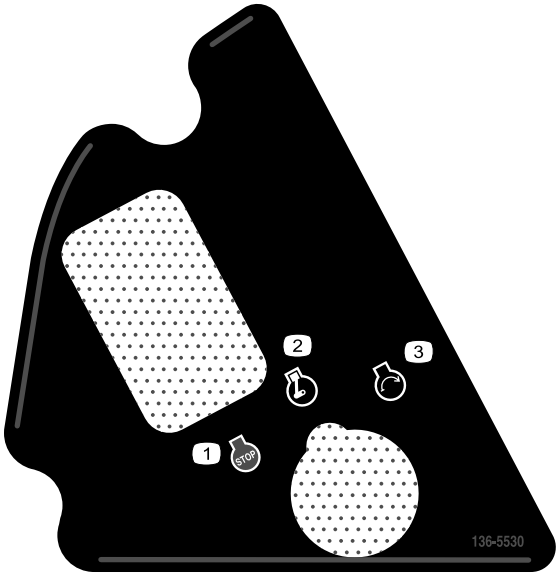
1. Accessory—15 A
2. Power—20 A
3. Engine start relay
4. Engine power relay
5. Fan relay



decal135-7898

135-7898

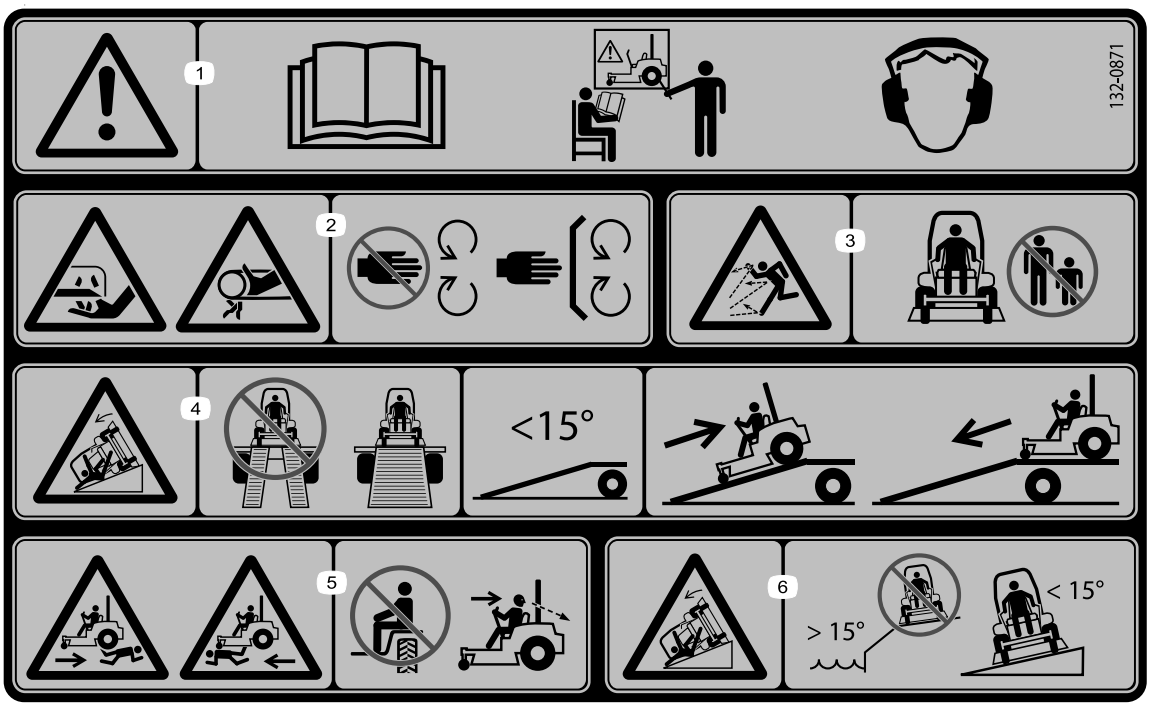
1. Wheel lug nut—torque to 129 N·m (95 ft-lb).
2. Wheel hub nut—torque to 441 N·m (325 ft-lb).
3. Read the *Operator's Manual* before performing maintenance; check the torque after the first 100 hours and every 500 hours after.



decal136-5530

136-5530

1. Engine—stop
2. Engine—run
3. Engine—start



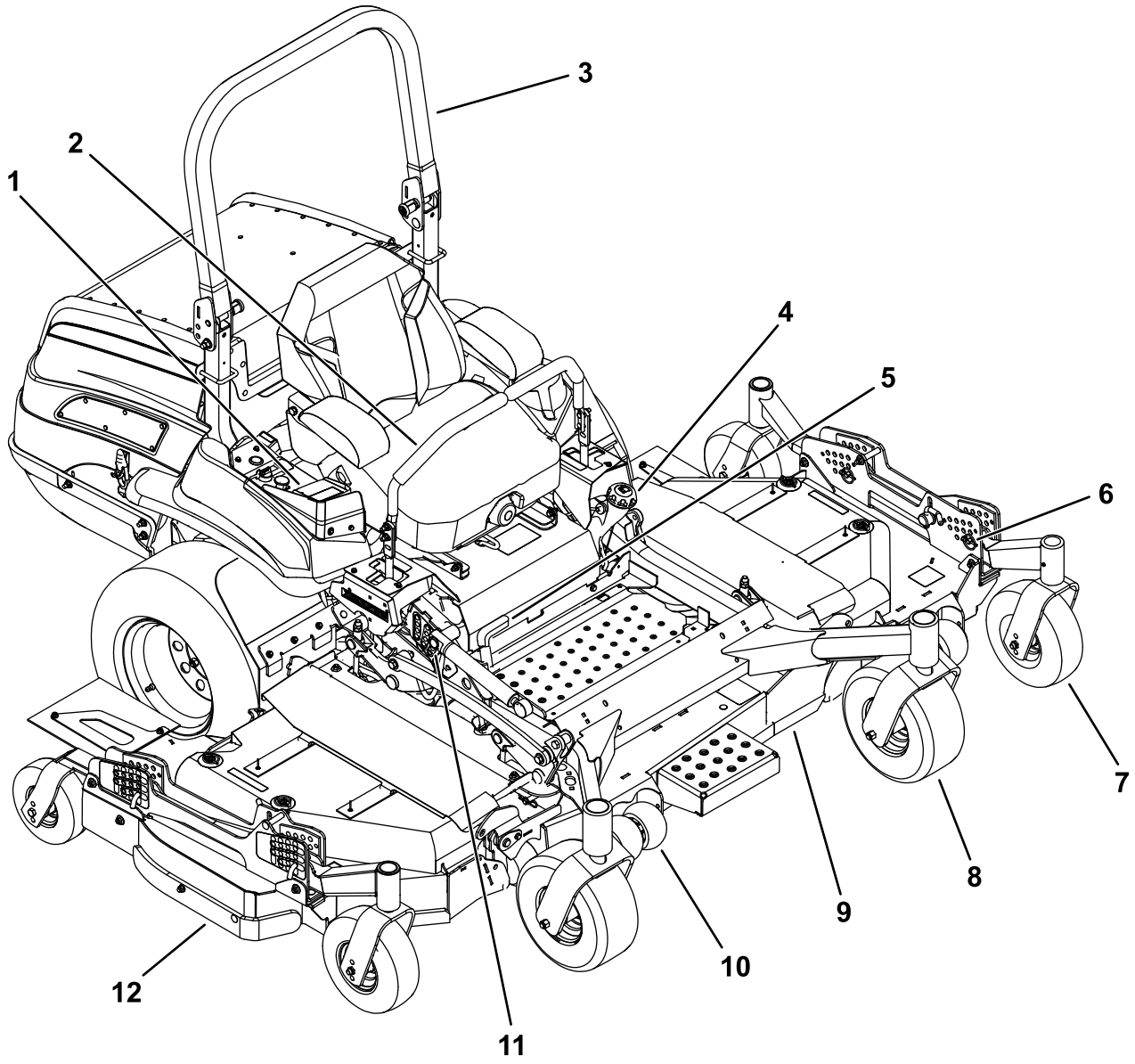
decal132-0871

132-0871

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

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

Product Overview



g297222

Figure 4

1. Display monitor	4. Fuel-tank cap	7. Wing deck caster wheel	10. Anti-scalp roller
2. Motion-control lever	5. Parking-brake lever	8. Caster wheel	11. Center deck height-of-cut pin
3. Roll bar	6. Wing deck height-of-cut pin	9. Center deck	12. Wing deck

Controls

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

Control Panel

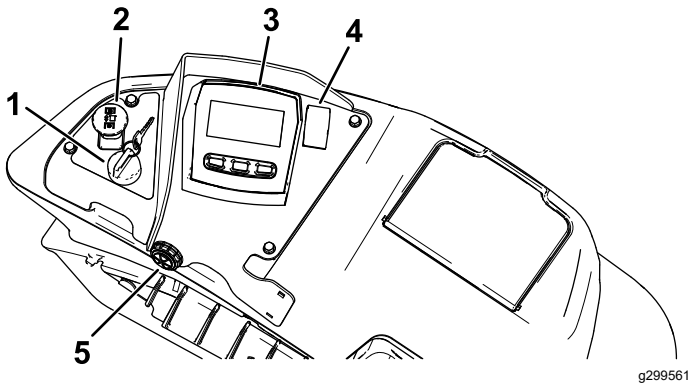


Figure 5

1. Key switch
2. Blade-control switch (power takeoff)
3. Horizon display monitor
4. Deck lift and wing deck fold/unfold switch
5. Audible alarm

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.

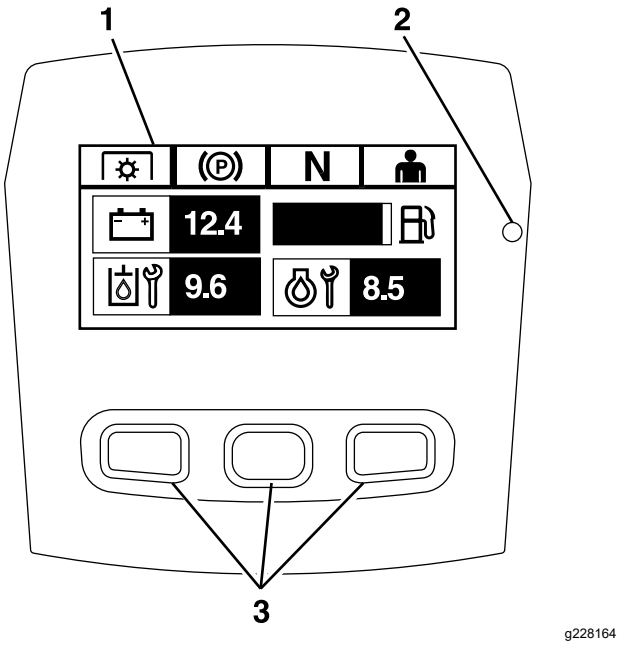


Figure 6

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 6).

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

Refer to the *Software Guide* for more information.

Throttle Control

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

Refer to the *Software Guide* for more information.

Deck Lift and Wing Deck Fold/Unfold Switch

Press the switch rearward to raise the center deck and to fold the wing decks.

Press the switch forward to lower the center deck and to unfold the wing decks.

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.

Important: **You must unfold the wing decks before you can engage the PTO.**

Neutral-Lock Position

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

Key Switch

The key switch, used to start and shut off the engine, has 3 positions: OFF, RUN, and START. Refer to Starting the Engine (page 25).

Attachments/Accessories

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

To ensure optimum performance and continued safety certification of the machine, use only genuine Toro replacement parts and accessories. Replacement parts and accessories made by other manufacturers could be dangerous, and such use could void the product warranty.

Specifications

Cutting width	243.8 cm (96 inches)
Overall width	Working width—257.3 cm (101-5/16 inches)
	Transport width set at the 3-inches height of cut—184.2 cm (72-1/2 inches)
Overall length	243.3 cm (95-13/16 inches)
Overall height	Roll bar up—179.1 cm (70-1/2 inches)
	Roll bar down—127.8 cm (50-5/16 inches)
Tread width (center-to-center of tires, widthwise)	Drive wheels—118.9 cm (46-13/16 inches)
	Caster wheels—119.6 cm (47-1/16 inches)
Wheel base (center of the caster tire to the center of the drive tire)	143 cm (56-5/16 inches)
Overall weight	1039 kg (2,290 lb)

Operation

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

Before Operation

Before Operation Safety

General Safety

- Do not allow children or untrained people to operate or service the machine. Local regulations may restrict the age of the operator. The owner is responsible for training all operators and mechanics.
- Inspect the area where you will use the machine, and remove all objects that could interfere with the operation of the machine or that the machine could throw.
- Become familiar with the safe operation of the equipment, operator controls, and safety signs.
- Check that operator-presence controls, safety switches, and guards are attached and working properly. Do not operate the machine unless they are functioning properly.
- Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operator's position. Allow the machine to cool before servicing, adjusting, fueling, cleaning, or storing it.
- Before mowing, inspect the machine to ensure that the cutting assemblies are working properly.
- Evaluate the terrain to determine the appropriate equipment and any attachments or accessories required to operate the machine properly and safely.
- Wear appropriate clothing, including eye protection; long pants; substantial, slip-resistant footwear; and hearing protection. Tie back long hair and do not wear loose clothing or loose jewelry.
- Do not carry passengers on the machine.
- Keep bystanders and pets away from the machine during operation. Shut off the machine and attachment(s) if anyone enters the area.
- Do not operate the machine unless all guards and safety devices, such as the deflectors, are in place and functioning properly. Replace worn or deteriorated parts when necessary.

Fuel Safety

- Fuel is extremely flammable and highly explosive. A fire or explosion from fuel can burn you and others and can damage property.
  - To prevent a static charge from igniting the fuel, place the container and/or machine directly on the ground before filling, not in a vehicle or on an object.
  - Fill the fuel tank outdoors on level ground, in an open area, and when the engine is cold. Wipe up any fuel that spills.
  - Do not handle fuel when smoking or around an open flame or sparks.
  - Do not remove the fuel cap or add fuel to the tank while the engine is running or hot.
  - If you spill fuel, do not attempt to start the engine. Avoid creating a source of ignition until the fuel vapors have dissipated.
  - Store fuel in an approved container and keep it out of the reach of children.
- Fuel is harmful or fatal if swallowed. Long-term exposure to vapors can cause serious injury and illness.
  - Avoid prolonged breathing of vapors.
  - Keep your hands and face away from the nozzle and the fuel-tank opening.
  - Keep fuel away from your eyes and skin.
- Do not store the machine or fuel container where there is an open flame, spark, or pilot light, such as on a water heater or on other appliances.
- Do not fill containers inside a vehicle or on a truck or trailer bed with a plastic liner. Always place containers on the ground and away from your vehicle before filling.
- Remove the equipment from the truck or trailer and refuel it while it is on the ground. If this is not possible, then refuel from a portable container rather than from a fuel-dispenser nozzle.
- Do not operate the machine without the entire exhaust system in place and in proper working condition.
- Keep the fuel-dispenser nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete. Do not use a nozzle lock-open device.
- If you spill fuel on your clothing, change your clothing immediately.
- Do not overfill the fuel tank. Replace the fuel cap and tighten it securely.
- Clean grass and debris from the cutting unit, muffler, drives, and engine compartment to help prevent fires. Clean up oil or fuel spills.

Adding Fuel

Recommended Fuel

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

Using Stabilizer/Conditioner

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

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

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

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

Note: A fuel stabilizer/conditioner is most effective when mixed with fresh fuel. To minimize the chance of varnish deposits in the fuel system, use fuel stabilizer at all times.

Filling the Fuel Tank

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

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

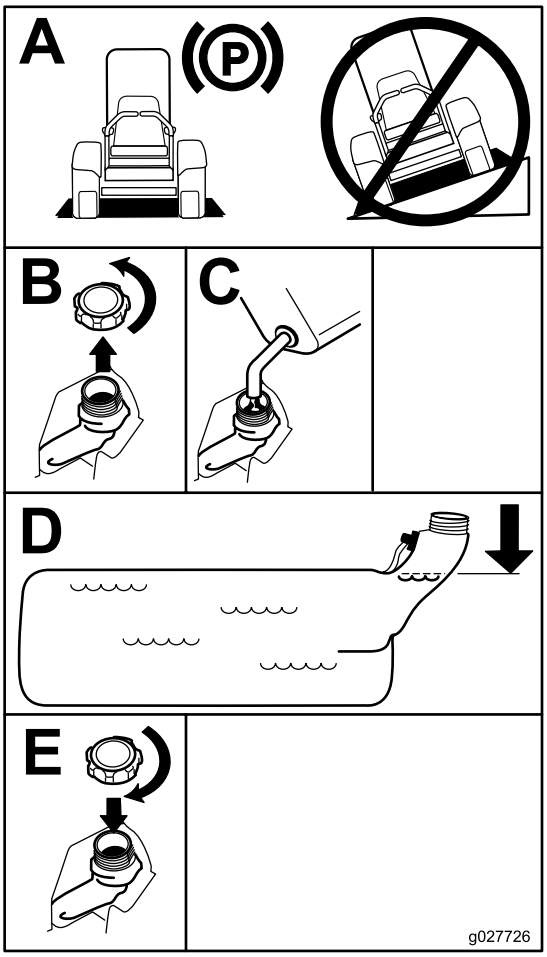


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Figure 7

Performing Daily Maintenance

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

Breaking in a New Machine

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

Using the Rollover Protection System (ROPS)

⚠ WARNING

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

Ensure that the rear part of the seat is secured with the seat latch.

⚠ WARNING

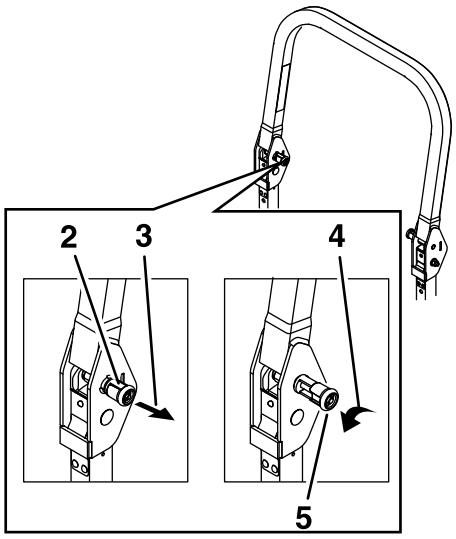
There is no rollover protection when the roll bar is in the down position.

- **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.**

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

1. Ensure that the knob is completely latched with the tabs interlocking as shown in Figure 8 to lock the roll bar in the raised position.
2. To lower the roll bar, apply forward pressure to the upper part of the roll bar.
3. Pull both knobs out and rotate them 90° so they are not engaged (Figure 8).
4. To raise the roll bar, raise the roll bar to the operate position, rotate the knobs so that they move partially into the grooves (Figure 8).
5. Raise the roll bar to the full upright position while pushing on the upper roll bar and the pins snap into position when the holes align with the pins (Figure 8).

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

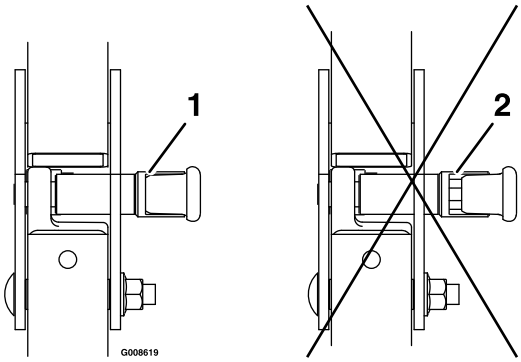


g225804

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

6. Push on the roll bar and ensure that both pins are engaged (Figure 9).



g008619

Figure 9

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

Using the Safety-Interlock System

⚠ WARNING

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

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

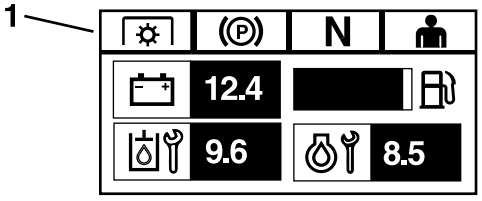
Understanding the Safety-Interlock System

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

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

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

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



g230650

Figure 10

1. Symbols display on the monitor when the interlock components are in the correct position.

Testing the Safety-Interlock System

Service Interval: Before each use or daily

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

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

Positioning the Seat

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

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

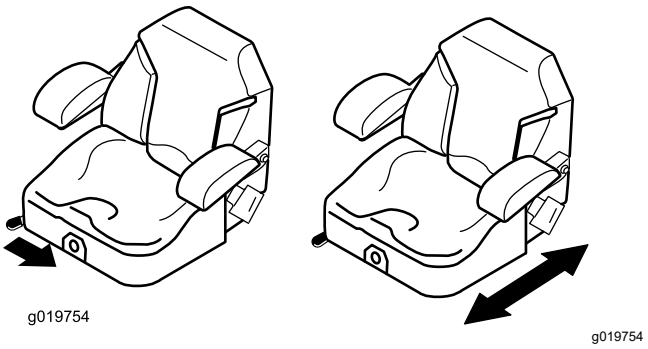


Figure 11

Unlatching the Seat

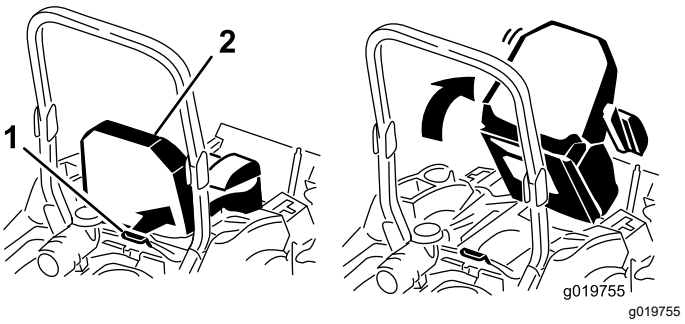


Figure 12

1. Seat latch
2. Seat

Changing the Seat Suspension

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

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

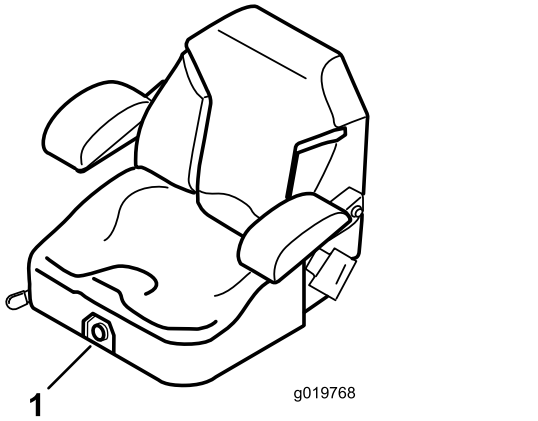


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Figure 13

1. Seat-suspension knob

During Operation

During Operation Safety

General Safety

- The owner/operator can prevent and is responsible for accidents that may cause personal injury or property damage.
- Use your full attention while operating the machine. Do not engage in any activity that causes distractions; otherwise, injury or property damage may occur.
- Do not operate the machine while ill, tired, or under the influence of alcohol or drugs.
- Contacting the blade can result in serious personal injury. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position. When you turn the key to the OFF position, the engine should shut off and the blade should stop. If not, stop using your machine immediately and contact an Authorized Service Dealer.
- Operate the machine only in good visibility and appropriate weather conditions. Do not operate the machine when there is the risk of lightning.
- Keep your hands and feet away from the cutting units. Keep clear of the discharge opening.
- Do not mow in reverse unless it is absolutely necessary. Always look down and behind you before moving the machine in reverse.
- Use extreme care when approaching blind corners, shrubs, trees, or other objects that may block your view.
- Stop the blades whenever you are not mowing.
- If the machine strikes an object or starts to vibrate, immediately shut off the engine, remove the key (if equipped), and wait for all moving parts to stop before examining the machine for damage. Make all necessary repairs before resuming operation.
- Slow down and use caution when making turns and crossing roads and sidewalks with the machine. Always yield the right-of-way.
- Before you leave the operating position, do the following:
  - Park the machine on a level surface.
  - Disengage the power takeoff and lower the attachments.
  - Engage the parking brake.
  - Shut off the engine and remove the key.
  - Wait for all moving parts to stop.

- Operate the engine only in well-ventilated areas. Exhaust gases contain carbon monoxide, which is lethal if inhaled.
- Never leave a running machine unattended.
- Attach towed equipment to the machine only at the hitch point.
- Do not operate the machine unless all guards and safety devices, such as the deflectors, are in place and functioning properly. Replace worn or deteriorated parts when necessary.
- Use only accessories and attachments approved by Toro.
- This machine produces sound levels in excess of 85 dBA at the operator's ear and can cause hearing loss through extended periods of exposure.

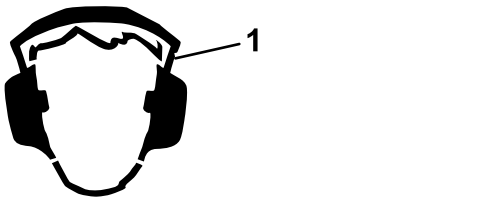

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Figure 14

1. Wear hearing protection.

- Clean grass and debris from the cutting unit, drives, muffler, and engine to help prevent fires.
- Start the engine with your feet well away from the blades.
- Be aware of the mower discharge path and direct the discharge away from others. Avoid discharging material against a wall or obstruction because the material may ricochet back toward you.
- Stop the blades, slow down the machine, and use caution when crossing surfaces other than grass or when transporting the machine to and from the operating area.
- Do not change the engine governor speed or overspeed the engine.
- 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 operating area and under the watchful care of a responsible adult other than the operator.
- Be alert and shut off the machine if children enter the operating area.
- Before backing up or turning the machine, look down and all around for small children.
- Do not carry children on the machine, even when the blades are not moving. Children could fall off and be seriously injured or prevent you from safely operating the machine. Children who have been given rides in the past could appear in the operating area without warning and be run over or backed over by the machine.

Rollover Protection System (ROPS) Safety

- The ROPS is an integral safety device. Do not remove any of the ROPS components from the machine.
- Ensure that the seat belt is attached and that you can release it quickly in an emergency.
- Keep the roll bar in the fully raised and locked position and always wear your seat belt whenever the roll bar is up.
- Check carefully for overhead objects before you drive under them, and do not contact them.
- Replace damaged ROPS components. Do not repair or alter them.
- There is no rollover protection when the roll bar is down.
- Wheels dropping over edges, over steep banks, or into water can cause a rollover, which may result in serious injury or death.
- Do not wear the seat belt when the roll bar is down.
- Lower the roll bar only when absolutely necessary; raise it as soon as clearance permits.
- In the event of a rollover, take the machine to an Authorized Service Dealer to inspect the ROPS.
- Use only Toro approved accessories and attachments for the ROPS.

Slope Safety

- Slopes are a major factor related to loss of control and rollover accidents, which can result in severe injury or death. The operator is responsible for safe slope operation. Operating the machine on any slope requires extra caution. Before using the machine on a slope, do the following:
  - Review and understand the slope instructions in the manual and on the machine.
  - Use an angle indicator to determine the approximate slope angle of the area.
  - Never operate on slopes greater than 15°.
  - Evaluate the site conditions of the day to determine if the slope is safe for machine operation. Use common sense and good judgment when performing this evaluation. Changes in the terrain, such as moisture, can quickly affect the operation of the machine on a slope.
- Identify hazards at the base of the slope. Do not operate the machine near drop-offs, ditches,

embankments, water, or other hazards. The machine could suddenly roll over if a wheel goes over the edge or the edge collapses. Keep a safe distance (twice the width of the machine) between the machine and any hazard. Use a walk-behind machine or a hand trimmer to mow the grass in these areas.

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

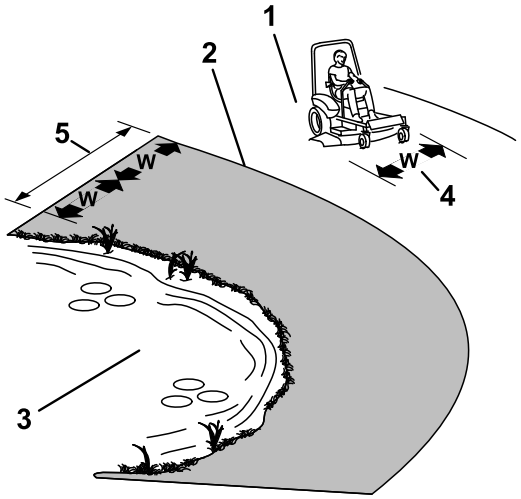

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Figure 15

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

Operating the Parking Brake

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

Engaging the Parking Brake

Park the machine on a level surface.

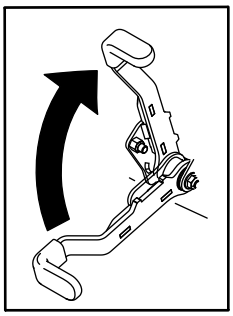

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Figure 16

Disengaging the Parking Brake

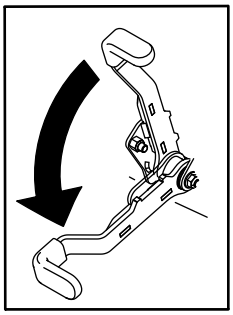

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Figure 17

Lowering the Wing Decks

Important: **You must unfold the wing decks before you can engage the PTO.**

1. Remove the clevis pin and hairpin cotter that secures each wing in the upright position and place them in the storage position (Figure 18).

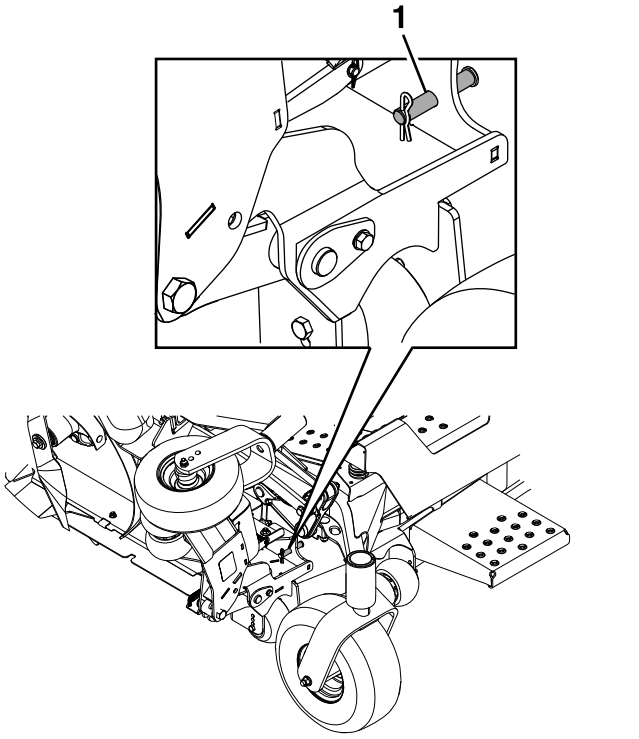

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Figure 18

1. Pin storage location

2. Ensure that all persons are clear of the deck wings.
3. Press and hold the bottom of the deck-lift switch; the wing decks lower first, then the center deck.

Operating the Mower Blade-Control Switch (PTO)

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

Engaging the Blade-Control Switch (PTO)

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

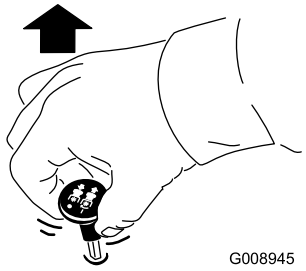

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Figure 19

Disengaging the Blade-Control Switch (PTO)

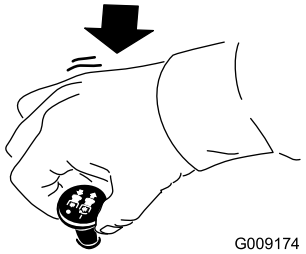

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Figure 20

Starting the Engine

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

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

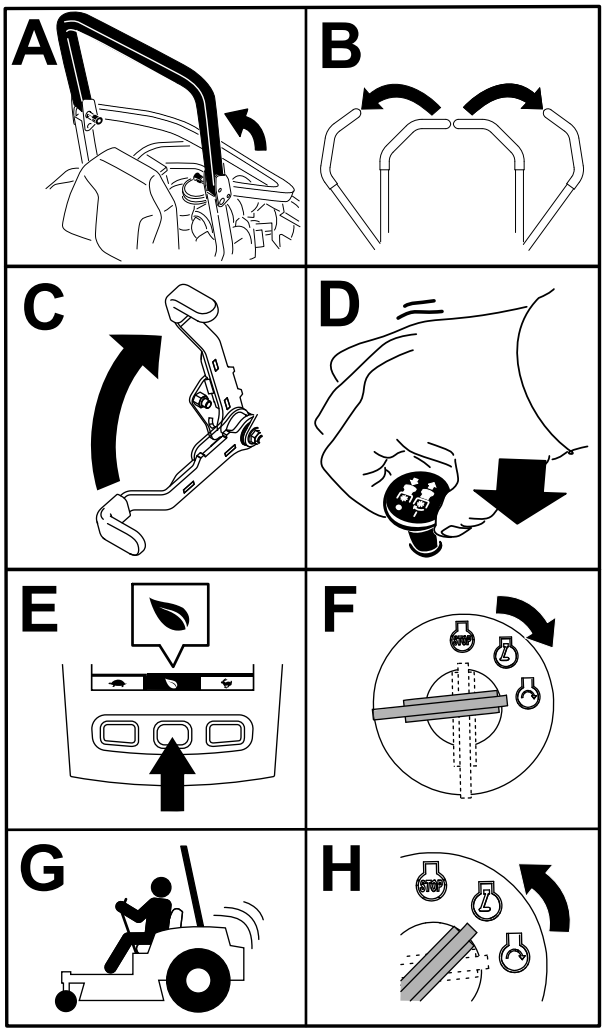

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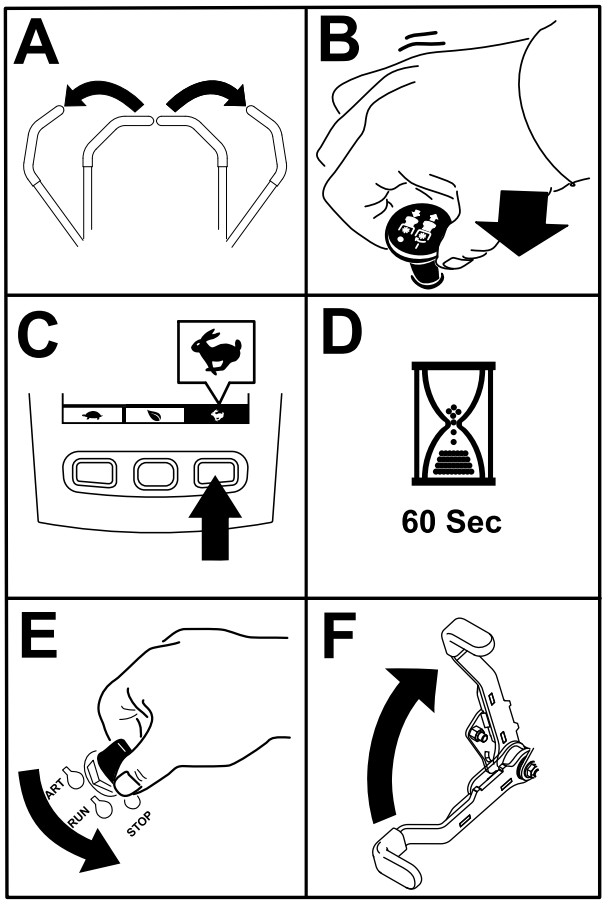
Figure 21

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.



g230715

Figure 22

Raising and Locking the Wing Decks

1. Ensure that all persons are clear of the deck wings.
2. Press and hold the bottom of the deck-lift switch; the center deck lowers first, then the outer wings.
3. Park the machine on a level surface, disengage the blade-control switch, and engage the parking brake.
4. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
5. Remove the clevis pin and hairpin cotter from the storage location and secure each wing in the upright position (Figure 23).

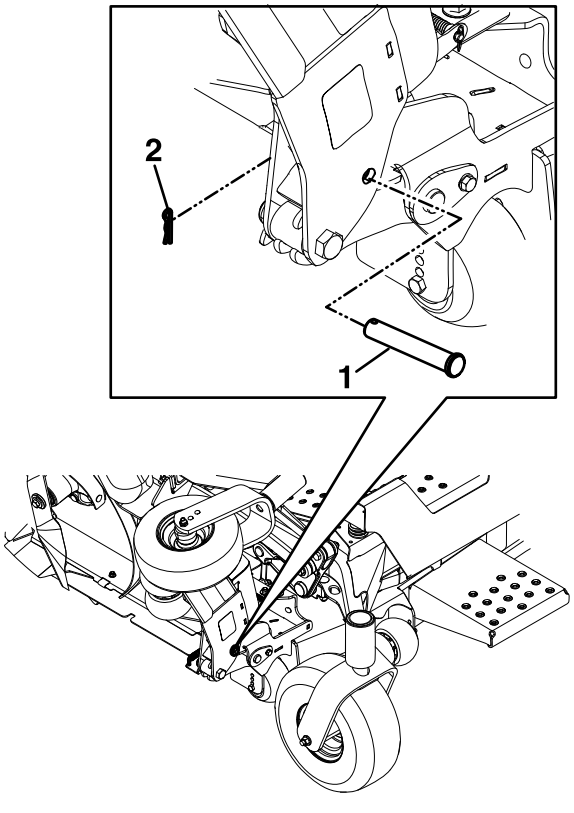


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Figure 23

1. Clevis pin
2. Hairpin cotter

Using the Motion-Control Levers

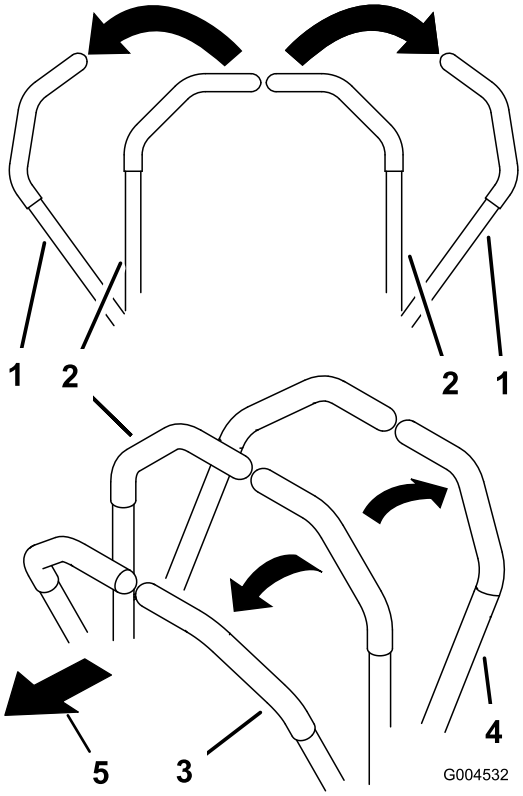

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Figure 24

1. Motion-control levers—NEUTRAL-LOCK position
2. Center, unlocked position
3. Forward
4. Reverse
5. Front of the 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.
2. Move the motion-control levers to the center, unlocked position.
3. To go forward, slowly push the motion-control levers forward (Figure 25).

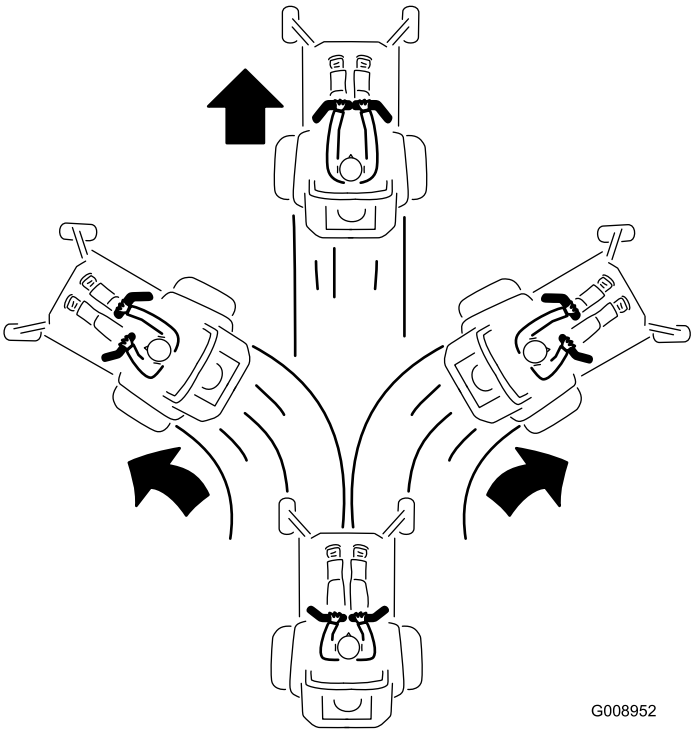

Figure 25

Driving in Reverse

1. Move the motion-control levers to the center, unlocked position.
2. To go in reverse, slowly pull the motion-control levers rearward (Figure 26).

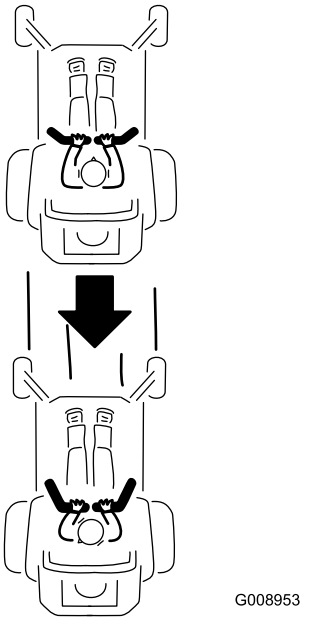

Figure 26

Adjusting the Height of Cut

The cutting height of the mower deck can be adjusted from 2.54 cm to 14 cm (1 to 5-1/2 inches) in 6.4 mm (1/4 inch) increments.

1. Park the machine on a level surface, disengage the blade-control switch, and engage the parking brake.
2. Press the top of deck-lift switch to raise the center deck and wing decks.
3. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
4. Adjust the center deck by performing the following procedure:
   A. Remove the height-of-cut pin from the deck-lift plate on the right side of the center deck.
   B. Insert the height-of-cut pin into the hole corresponding to the desired cutting height.

      See the decal on the side of the deck-lift plate for the cutting heights.
5. Adjust the side wing decks by performing the following procedure:
   A. Ensure that the wing decks are locked in place.
   B. Unlock the cam locks located on the height-of-cut channel on the wing deck (Figure 27).

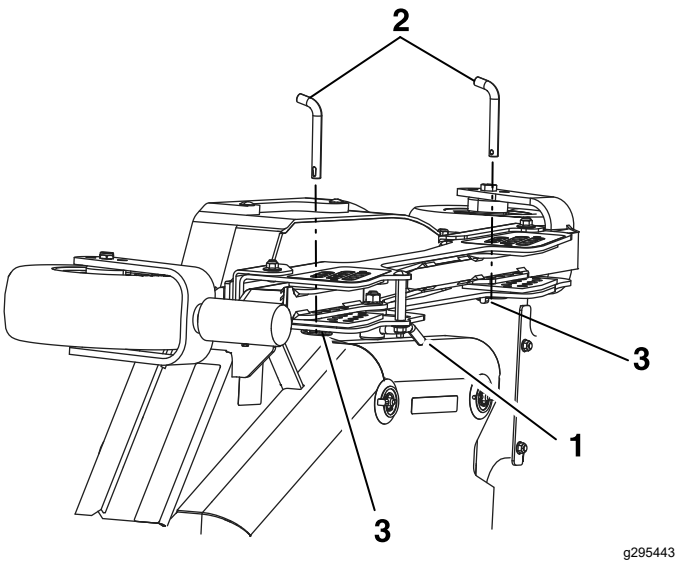

Figure 27

1. Cam lock
2. Height-of-cut pin
3. Lynch pin

   C. Remove the lynch pin from the height-of-cut pin on both the front and rear channels.
   D. Move the wing deck to the appropriate height and install the height-of-cut pins and lynch pins (Figure 27).
   E. Lock the cam lock.
   F. Repeat for the other wing deck.
6. If you desire additional height-of-cut range, adjust the front and rear gauge wheels on the wing deck as follows:
   A. Remove the mounting hardware from the gauge wheel.
   B. Adjust the front and rear gauge wheels to the appropriate hole location (see the chart below and Figure 28) and install the mounting hardware.

Hole Location	Height-of-Cut Range
Top hole (-1 on the decal)	25 to 89 mm (1 to 3-1/2 inches)
Middle hole (0 on the decal)	51 to 114 mm (2 to 4-1/2 inches)
Bottom hole (+1 on the decal)	76 to 140 mm (3 to 5-1/2 inches)

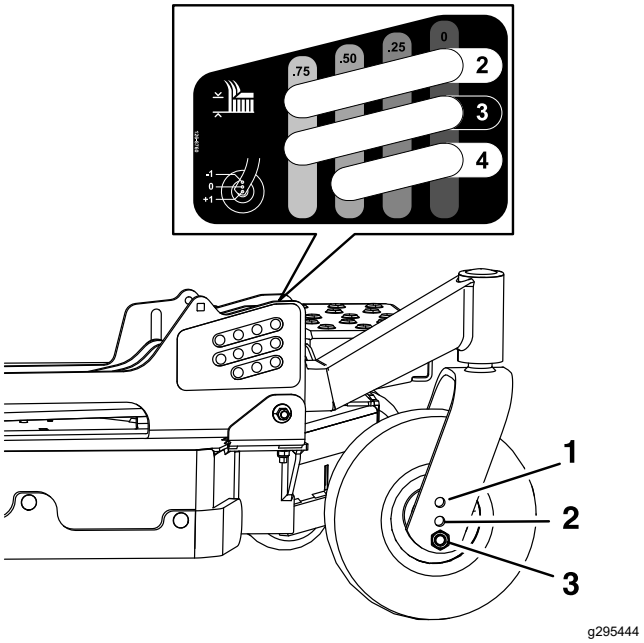

Figure 28

Height-of-cut range

1. Top hole (-1 on the decal)
2. Middle hole (0 on the decal)
3. Bottom hole (+1 on the decal)

   C. Repeat for the other wing deck.

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. After adjusting the height of cut, adjust the anti-scalp rollers by removing the mounting hardware.
5. Place the rollers in 1 of the positions shown in Figure 29.

   The rollers will maintain 19 mm (3/4 inch) clearance to the ground to minimize gouging and roller wear or damage.

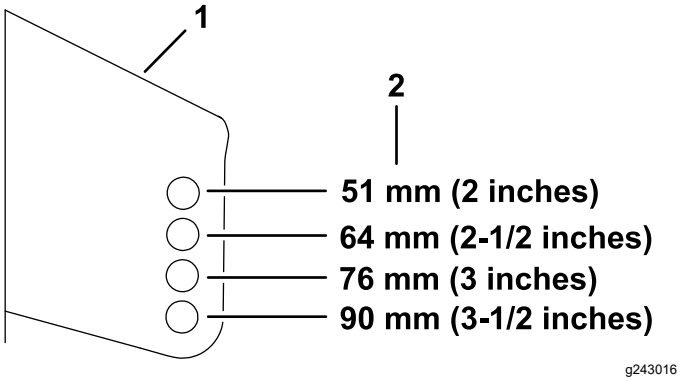

Figure 29

For cutting heights above 90 mm (3-1/5 inches), use the bottom hole. The rollers are still effective against scalping.

1. Anti-scalp roller mounting bracket
2. Cutting height

6. Torque the nyloc nut (3/8 inch) to 41 to 47 N·m (30 to 35 ft-lb) as shown in Figure 30.

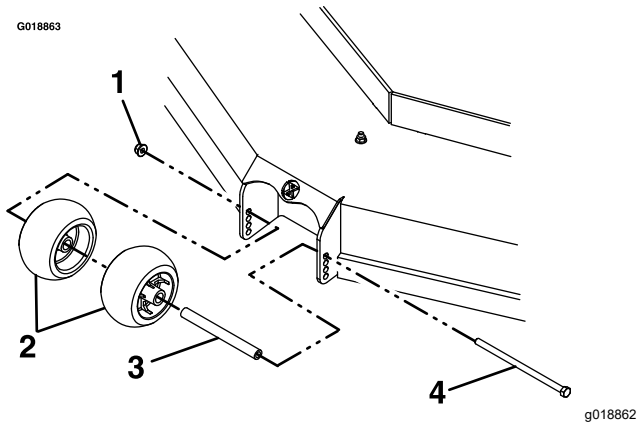

Figure 30

1. Nyloc nut (3/8 inch)
2. Anti-scalp rollers
3. Spacer
4. Bolt

The 96-inch deck has 7 anti-scalp roller locations. For adjustment, refer to Figure 31.

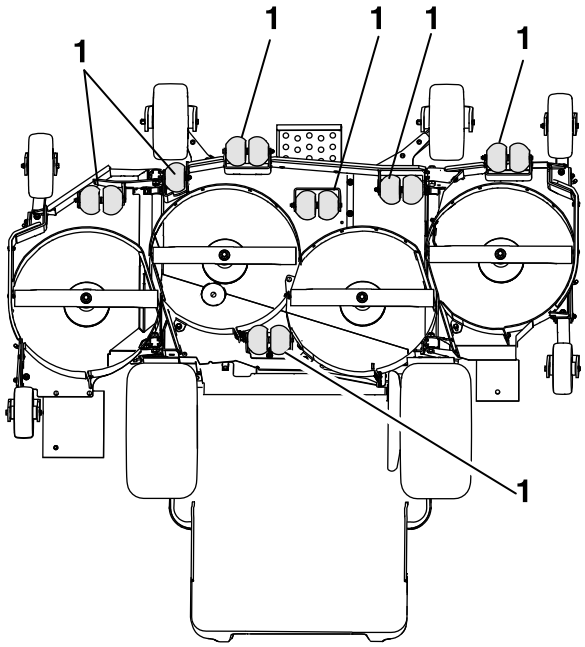

Figure 31

Underside of the mower deck

1. Anti-scalp roller

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

- Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operator's position. Allow the machine to cool before servicing, adjusting, fueling, cleaning, or storing it.
- Clean grass and debris from the cutting unit, muffler, drives, and engine compartment to help prevent fires. Clean up oil or fuel spills.
- Shut off the fuel and remove the key before storing or transporting the machine.

Using the Drive-Wheel-Release Valves

⚠ WARNING

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

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

⚠ WARNING

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

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

The drive-wheel-release valves are located in the back of each hydraulic-drive unit, under the seat.

Note: Make sure that the release valves are in the fully horizontal position when operating the machine; otherwise, severe damage to the hydraulic system can occur.

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 release-valve levers vertically to push the machine (Figure 32).

   Note: This allows hydraulic fluid to bypass the pump, enabling the wheels to turn.
4. Disengage the parking brake before pushing the machine.

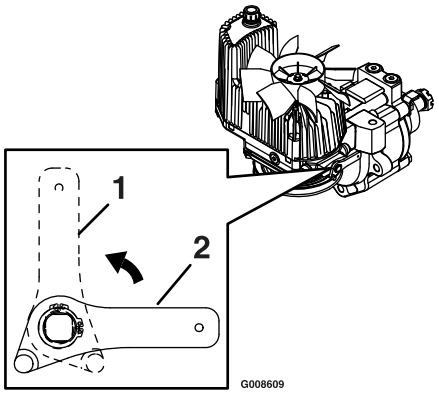

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Figure 32

1. Vertical to push the machine
2. Horizontal to run the machine

5. Rotate the release valve levers horizontally to run the machine (Figure 32).

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 33).

- **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.**

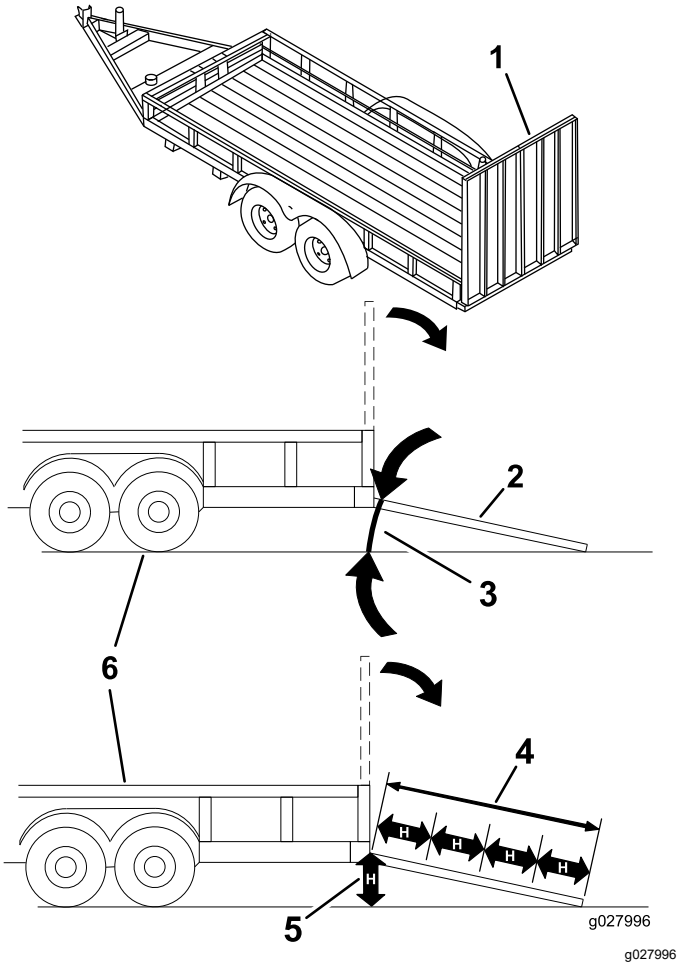

Figure 33

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 33).
4. Back the machine up the ramp (Figure 34).

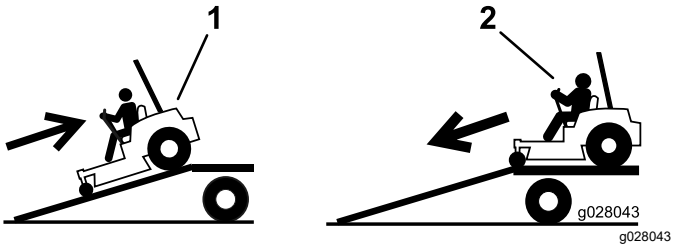

Figure 34

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

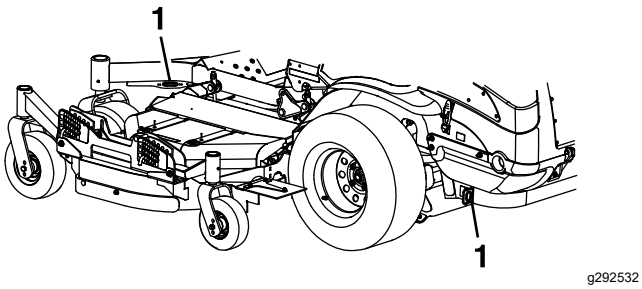

Figure 35

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 33).
2. Drive the machine forward down the ramp (Figure 34).

Maintenance

Maintenance Safety

- If you leave the key in the switch, someone could accidently start the engine and seriously injure you or other bystanders. Remove the key from the switch before you perform any maintenance.
- Before you leave the operator's position, do the following:
  - Park the machine on a level surface.
  - Disengage the drives.
  - Engage the parking brake.
  - Shut off the engine and remove the key.
  - Allow machine components to cool before performing maintenance.
- Do not allow untrained personnel to service the machine.
- Keep your hands and feet away from moving parts or hot surfaces. If possible, do not make adjustments with the engine running.
- Carefully release pressure from components with stored energy.
- Check the parking brake operation frequently. Adjust and service it as required.
- Never tamper with safety devices. Check their proper operation regularly.
- Clean grass and debris from the cutting unit, muffler, drives, and engine compartment to prevent fires.
- Clean up oil or fuel spills and remove fuel-soaked debris.
- Do not rely on hydraulic or mechanical jacks to support the machine; support the machine with jack stands whenever you raise the machine.
- Keep all parts in good working condition and all hardware tightened, especially the blade-attachment hardware. Replace all worn or damaged decals.
- 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.
- To ensure optimum performance, 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.

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first 5 hours	• Change the engine oil.
After the first 100 hours	• Check the wheel lug nuts. • Check the wheel hub slotted nut torque specifications. • Adjust the parking brake.
After the first 250 hours	• Change the hydraulic filter and fluid.
Before each use or daily	• Check the safety system. • Check the air cleaner for dirty, loose or damaged parts. • Check the engine-oil level. • Inspect the blades. • Clean the grass and debris build-up from the machine and mower deck. • Clean the hydro fan cooling guards, hydro cooling fins, and fan.
Every 50 hours	• Check the spark arrester (if equipped). • Check the tire pressure. • Inspect the belts for cracks and wear. • Check the hydraulic-fluid level. • Check the deck-lift power unit fluid level.
Every 100 hours	• Lubricate the mower deck-lift pivots. • Change the engine oil and oil filter (more often in dirty or dusty conditions). • Check the wing deck bushings.
Every 150 hours	• Replace the fuel filter (more often in dusty, dirty conditions).

Maintenance Service Interval	Maintenance Procedure
Every 200 hours	• Grease the caster pivots (more often in dirty or dusty conditions). • Check the spark plug(s). • Adjust the frame caster-pivot bearing. • Adjust the wing deck caster-pivot bearings.
Every 250 hours	• Service or replace the air-cleaner foam element (more often under dusty, dirty conditions).
Every 400 hours	• Check the fuel lines and connections.
Every 500 hours	• Replace the air-cleaner paper element (more often under dusty, dirty conditions). • Replace the spark plug(s). • Check the wheel hub slotted nut torque specifications. • Adjust the parking brake. • Change the hydraulic filter and fluid is using Toro HYPR-OIL™ 500 fluid (Every 250 hours if using Mobil 1 15W50).
Every 800 hours	• Inspect the engine-valve clearance.
Monthly	• Check the battery charge.
Yearly	• Repack the caster-wheel bearings (more often in dirty or dusty conditions). • Grease the pump belt idler arm. • Greasing the caster-wheel hubs.
Yearly or before storage	• Change the deck-lift power unit fluid.

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

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.

Lubricating the Mower Deck-Lift Pivots

Service Interval: Every 100 hours

Use light oil or spray lubricant to lubricate the deck-lift pivots.

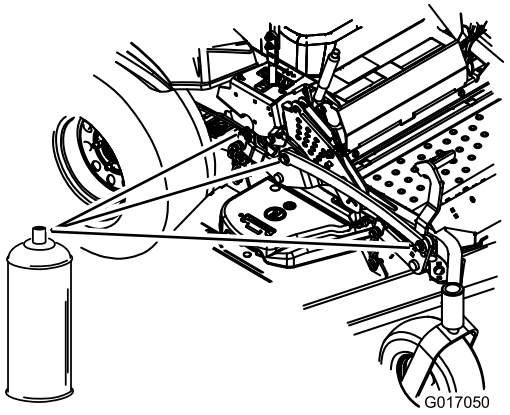

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Figure 36

Greasing the Caster Pivots

Service Interval: Every 200 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 Wing Deck Caster-Pivot Bearings (page 66).
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 Mower Deck

Service Interval: Yearly—Grease the pump belt idler arm.

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. Grease the mower deck idler-pulley pivot until grease comes out the bottom (Figure 37).

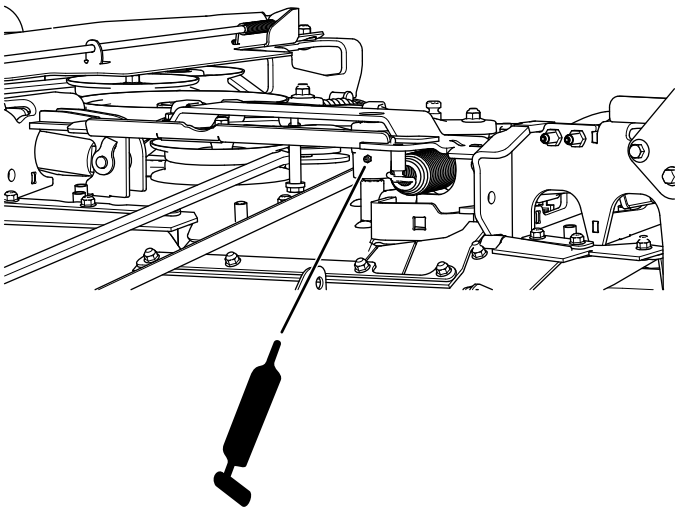

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Figure 37

4. Grease the 2 drive belt idler arms (Figure 38).

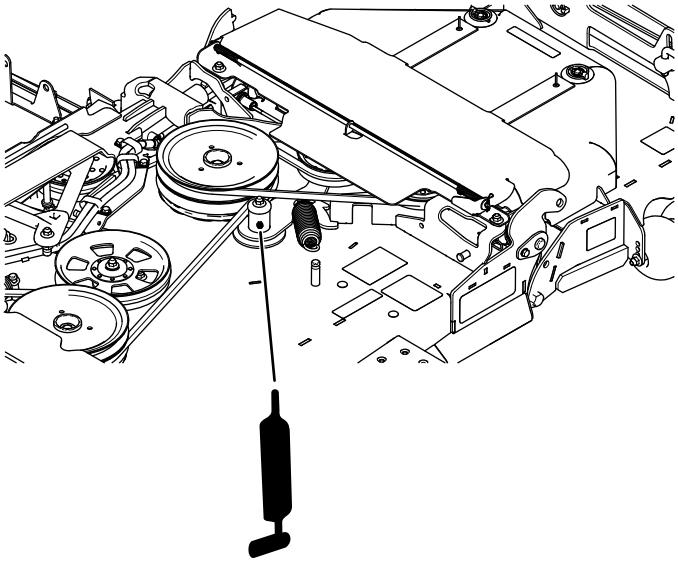

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Figure 38

5. Remove the dust cap and adjust the caster pivots.

Note: Keep the dust cap off until greasing is done.

6. Remove the hex plug.
7. Thread a grease fitting into the hole.
8. Pump grease into the fitting until it oozes out around the top bearing.
9. Remove the grease fitting in the hole.
10. Install the hex plug and dust cap (Figure 39).

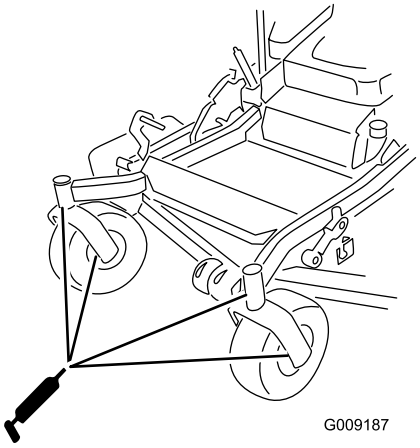

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Figure 39

11. Grease the caster-wheel bearings (Figure 39).

Greasing the Caster-Wheel Hubs

Service Interval: Yearly

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

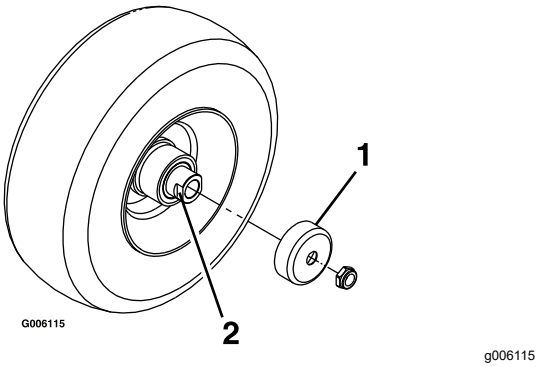

Figure 40

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

- Keep your hands, feet, face, clothing, and other body parts away from the muffler and other hot surfaces. Allow engine components to cool before performing maintenance.
- Do not change the engine governor speed or overspeed the engine.

Servicing the Air Cleaner

Service Interval: Before each use or daily—Check the air cleaner for dirty, loose or damaged parts.

Every 250 hours—Service or replace the air-cleaner foam element (more often under dusty, dirty conditions).

Every 500 hours—Replace the air-cleaner paper element (more often under dusty, dirty conditions).

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

Removing the Filters

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Release the latches on the air cleaner and pull the air-inlet cover off the air-cleaner body (Figure 41).
4. Clean the air-inlet screen and cover.
5. Install the air-inlet cover and secure it with the latches (Figure 41).

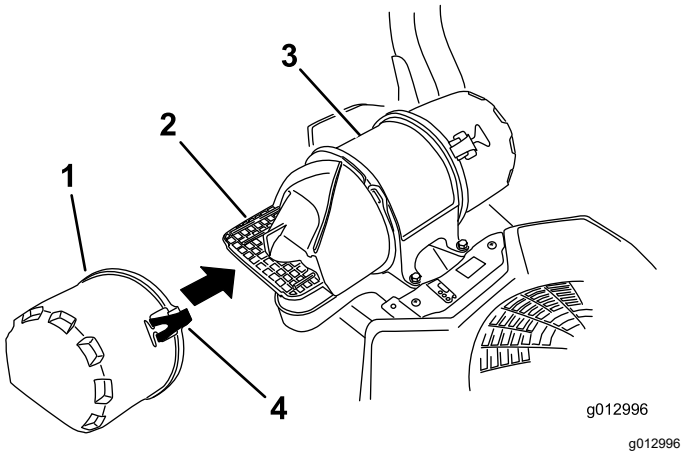

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Figure 41

1. Air-inlet cover
2. Air-inlet screen
3. Air-cleaner body
4. Latch

6. Release the latches on the air cleaner and pull the air-cleaner cover off the air-cleaner body (Figure 42).
7. Clean the inside of the air-cleaner cover with compressed air.
8. Gently slide the primary filter out of the air-cleaner body (Figure 42).

   Note: Avoid knocking the filter into the side of the body.
9. Remove the inner filter only if you intend to replace it.

   Important: **Never attempt to clean the inner filter. If the safety filter is dirty, then the primary filter is damaged. Replace both filters.**

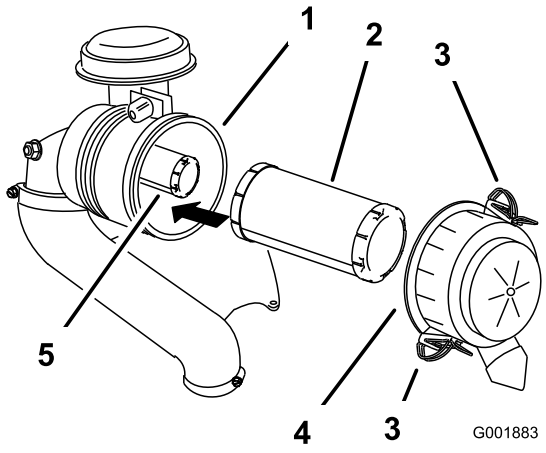

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Figure 42

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

10. Inspect the primary filter for damage by looking into the filter, while shining a bright light on the outside of the filter.

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

Servicing the Foam Element

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

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

Servicing the Paper Element

1. Gently tap the paper element to dislodge dirt.

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

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

Installing the Filters

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

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

   Note: Do not use a damaged filter.
2. If you are replacing the inner filter, carefully slide it into the filter body (Figure 42).
3. Carefully slide the primary filter over the safety filter (Figure 42).

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

   Important: **Do not press on the soft, inside area of the filter.**
4. Install the air-cleaner cover and secure the latches (Figure 42).

Servicing the Engine Oil

Service Interval: Before each use or daily

After the first 5 hours

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

Engine-Oil Specifications

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

Oil Capacity: 1.9 to 2.6 L (2.0 to 2.7 US qt) with a filter change

Viscosity: See the table below.

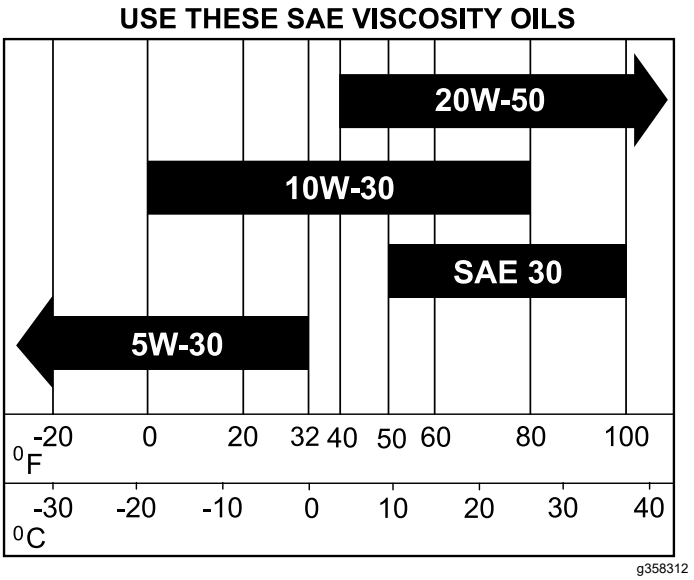

Figure 43

Checking the Engine-Oil Level

Note: Check the oil when the engine is cold.

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

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

   Note: Ensure that the engine is cool so that the oil has had time to drain into the sump.
3. To keep dirt, grass clippings, etc., out of the engine, clean the area around the oil-fill cap and dipstick before removing it (Figure 44).

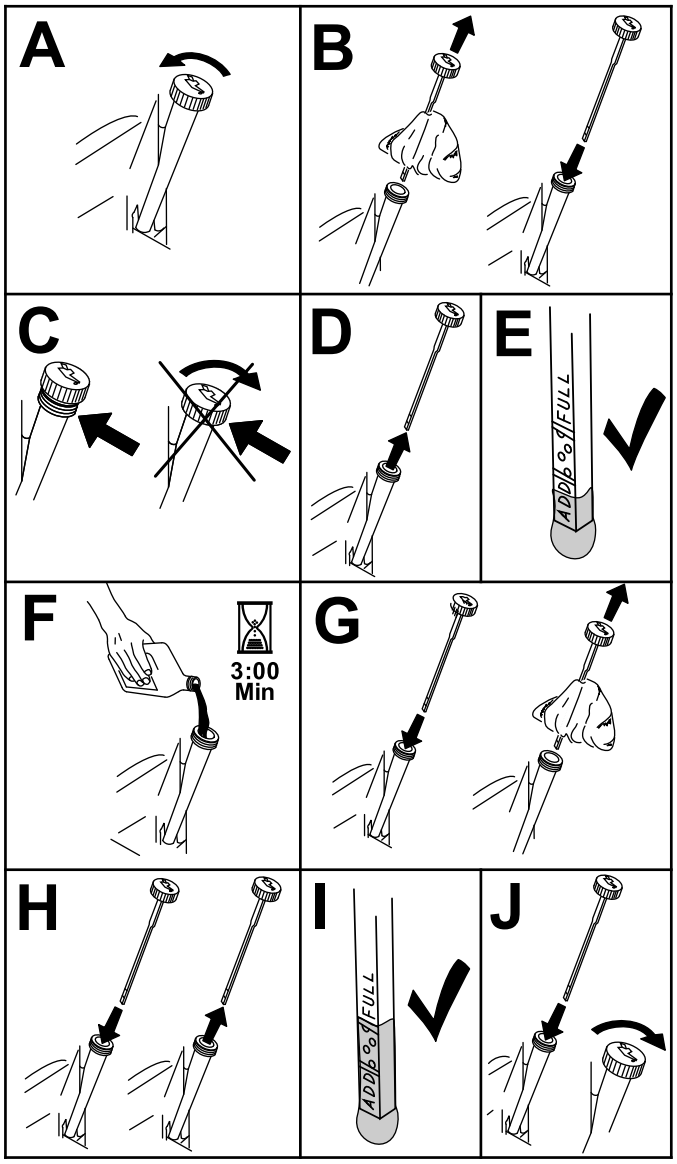

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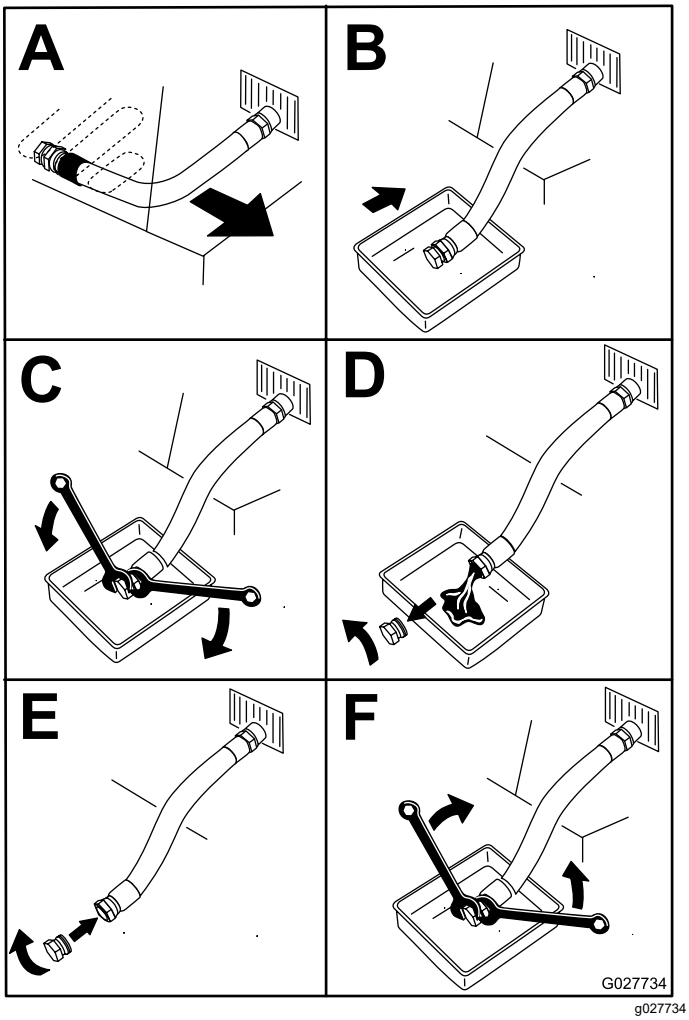
Figure 44

Changing the Engine Oil

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

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

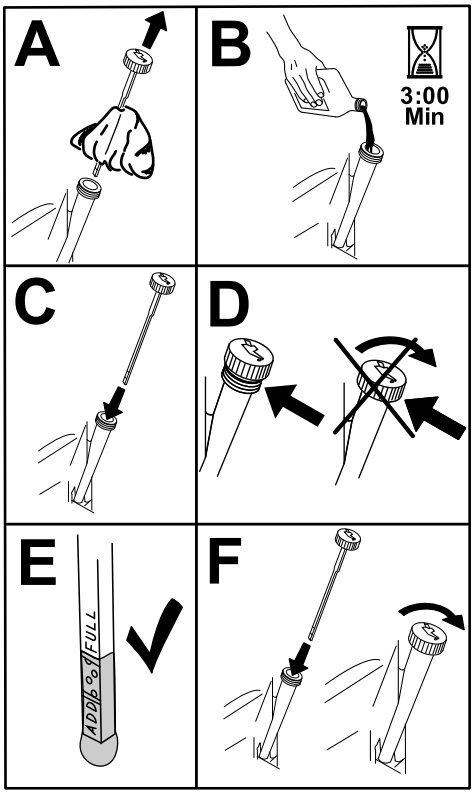
   Note: This warms the oil so that it drains better.
2. Park the machine so that the drain side is slightly lower than the opposite side to ensure that the oil drains completely.
3. Disengage the blade-control switch (PTO) and engage the parking brake.
4. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
5. Drain the oil from the engine (Figure 45).



g027734

Figure 45

6. Slowly pour approximately 80% of the specified oil into the filler tube and slowly add the additional oil to bring it to the Full mark (Figure 46).



g194610

Figure 46

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

Changing the Engine-Oil Filter

1. Drain the oil from the engine; refer to Changing the Engine Oil (page 41).
2. Change the engine-oil filter (Figure 47).

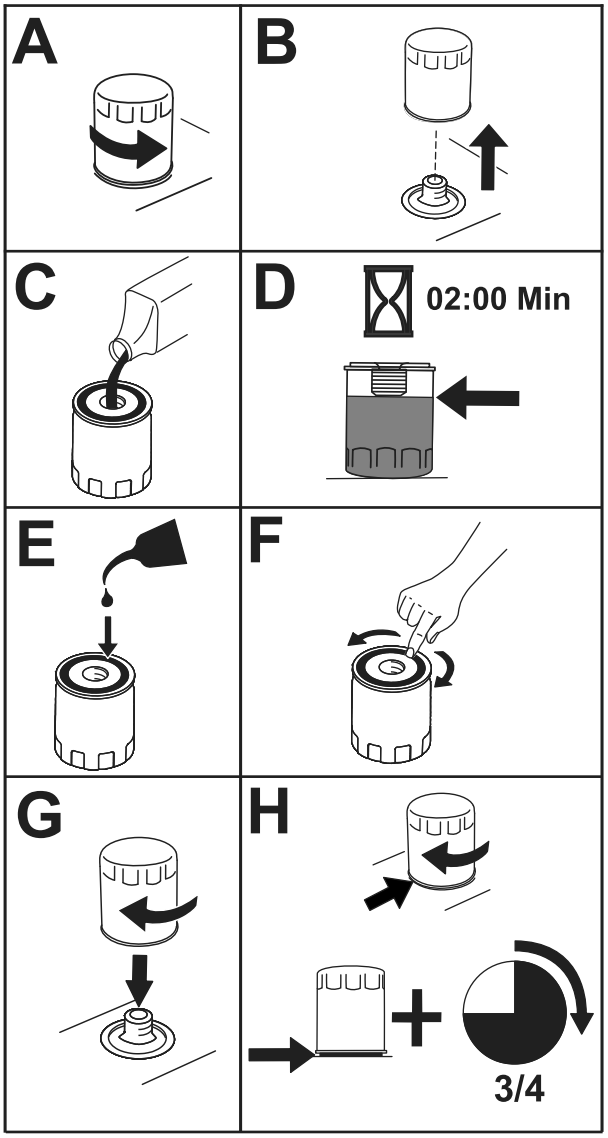


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Figure 47

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

3. Fill the crankcase with the proper type of new oil; refer to Engine-Oil Specifications (page 40).

Servicing the Spark Plug

Service Interval: Every 200 hours—Check the spark plug(s).

Every 500 hours—Replace the spark plug(s).

Type: Champion XC12YC

Air Gap: 0.76 mm (0.03 inch)

Removing the Spark Plug

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Clean the area around the base of the plug(s) to keep dirt and debris out of the engine.
4. Locate and remove the spark plug(s) as shown in Figure 48.

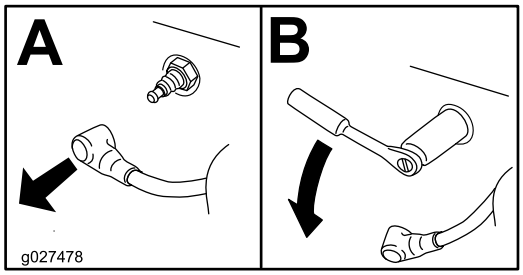

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Figure 48

Checking the Spark Plug

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

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

Set the gap to 0.76 mm (0.03 inch).

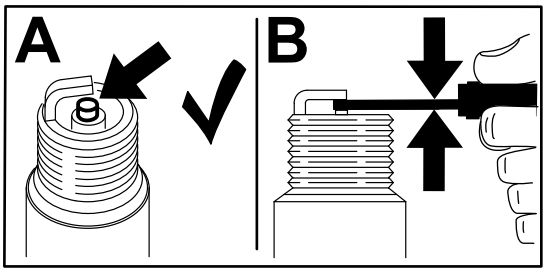

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Figure 49

Installing the Spark Plug

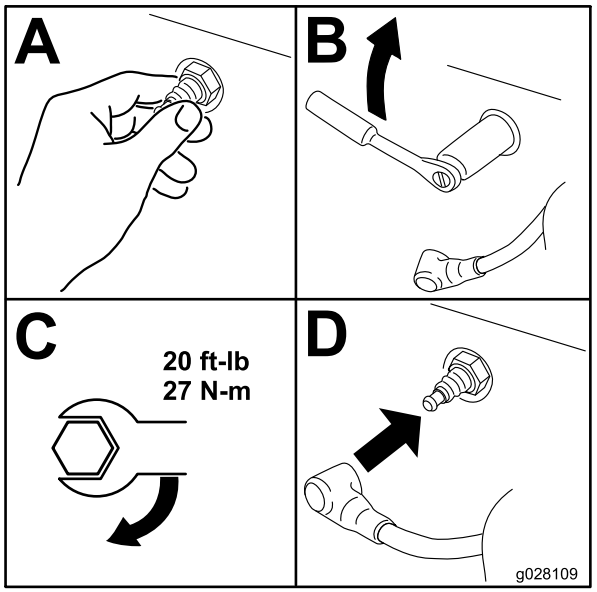

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Figure 50

Checking the Spark Arrester

For Machines with a Spark Arrester

Service Interval: Every 50 hours

⚠ WARNING

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

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

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

Fuel System Maintenance

⚠ WARNING

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

Use only approved fuel lines and fuel filters.

Replacing the Fuel Filter

Service Interval: Every 150 hours (more often in dusty, dirty conditions).

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

1. Park the machine on a level surface, disengage the blade-control switch (PTO), and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Allow the machine to cool down.
4. Close the fuel-shutoff valve.
5. Replace the fuel filter (Figure 51).

   Note: Ensure that the markings on the filter follow the fuel flow direction.

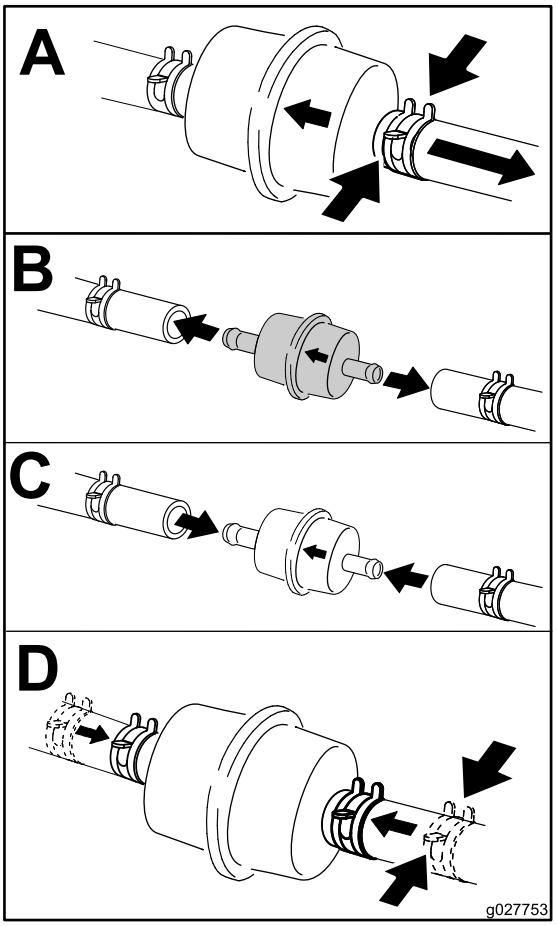

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Figure 51

6. Open the fuel-shutoff valve.

Servicing the Fuel Tank

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

Inspecting the Engine-Valve Clearance

Service Interval: Every 800 hours

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

Checking the Fuel Lines and Connections

Service Interval: Every 400 hours

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

Electrical System Maintenance

Electrical System Safety

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

Servicing the Battery

⚠ DANGER

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

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

Checking the Battery Charge

Service Interval: Monthly

Allowing the battery to stand for an extended period of time without charging it results in reduced performance and service life. To preserve optimum battery performance and life, charge the battery in storage when the open circuit voltage drops to 12.4 V.

Note: To prevent damage due to freezing, fully charge the battery before putting it away for winter storage.

Check the voltage of the battery with a digital voltmeter. Locate the voltage reading of the battery in the table below and charge the battery for the recommended time interval to bring the charge up to a full charge of 12.6 V or greater.

Important: **Ensure that the negative (–) battery cable is disconnected and the battery charger used for charging the battery has an output of 16 V and 7 A or less to avoid damaging the battery (see the chart for the recommended charger settings).**

Voltage Reading	Percent Charge	Maximum Charger Settings	Charging Interval
12.6 V or greater	100%	16 V/7 A	No charging required
12.4 V to 12.6 V	75% to 100%	16 V/7 A	30 minutes
12.2 V to 12.4 V	50% to 75%	16 V/7 A	1 hour
12.0 V to 12.2 V	25% to 50%	14.4 V/4 A	2 hours
11.7 V to 12.0 V	0% to 25%	14.4 V/4 A	3 hours
11.7 V or less	0%	14.4 V/2 A	6 hours or more

Charging the Battery

⚠ 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 52).
3. Install the battery in the machine and connect the battery cables.

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

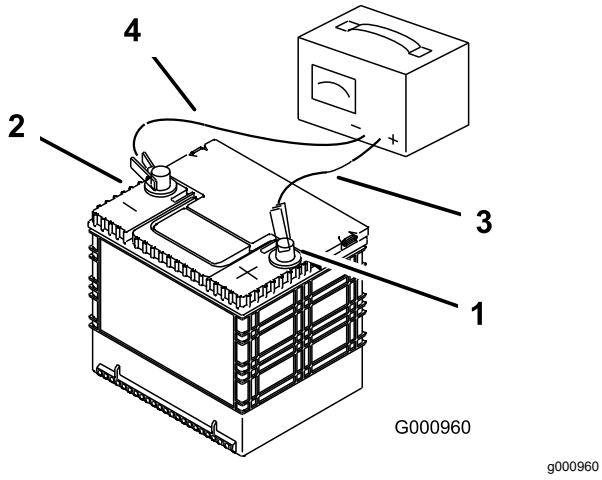

Figure 52

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

Jump-Starting the Machine

1. Check the weak battery for terminal corrosion (white, green, or blue “snow”).

   You must clean it off prior to jump-starting. Clean and tighten connections as necessary.

⚠ CAUTION

Corrosion or loose connections can cause unwanted electrical voltage spikes at anytime during the jump-starting procedure.

Do not attempt to jump-start with loose or corroded battery terminals; otherwise, damage may occur to the engine.

⚠ DANGER

Jump-starting a weak battery that is cracked, frozen, has low electrolyte level, or an open/shorted battery cell, can cause an explosion, resulting in serious injury.

Do not jump-start a weak battery if these conditions exist.

2. Ensure that the booster is a good and fully-charged lead acid battery at 12.6 V or greater. Use properly sized jumper cables (4 to 6 AWG) with short lengths to reduce voltage drop between systems. Ensure that the cables are color-coded or labeled for the correct polarity.

⚠ CAUTION

Connecting the jumper cables incorrectly (wrong polarity) can immediately damage the electrical system.

Be certain of battery-terminal polarity and jumper-cable polarity when connecting batteries.

Note: The following instructions are adapted from the SAE J1494 Rev. Dec. 2001 – Battery Booster Cables – Surface Vehicle Recommended Practice (SAE – Society of Automotive Engineers).

Important: **Ensure that the vent caps are tight and level. Place a damp cloth, if available, over any vent caps on both batteries. Ensure that the machines do not touch and that both electrical systems are shut off and at the same rated system voltage. These instructions are for negative ground systems only.**

3. Connect the positive (+) cable to the positive (+) terminal of the discharged battery that is wired to the starter or solenoid (Figure 53).

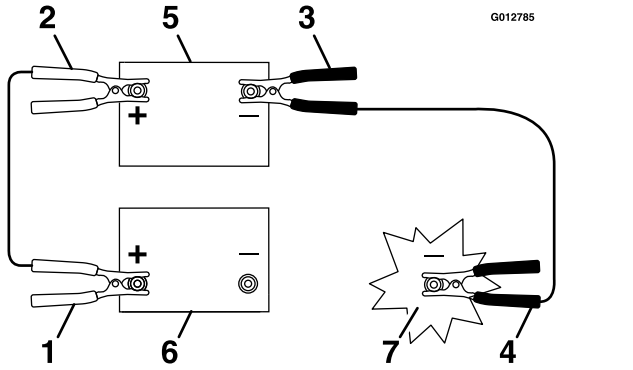

Figure 53

1. Positive (+) cable on the discharged battery
2. Positive (+) cable on the booster battery
3. Negative (–) cable on the booster battery
4. Negative (–) cable on the engine block
5. Booster battery
6. Discharged battery
7. Engine block

4. Connect the other end of the positive cable to the positive terminal of the booster battery.
5. Connect the black negative (–) cable to the other terminal (negative) of the booster battery.
6. Make the final connection on the engine block of the stalled machine (not to the negative post) away from the battery. Stand away from the machine.
7. Start the vehicle and remove the cables in the reverse order of connection (the engine block (black) connection is the first to disconnect).

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.

The fuse block is located to the right of the operator's seat.

1. To replace the fuses, pull out on the fuse to remove it.
2. Install a new fuse (Figure 54).

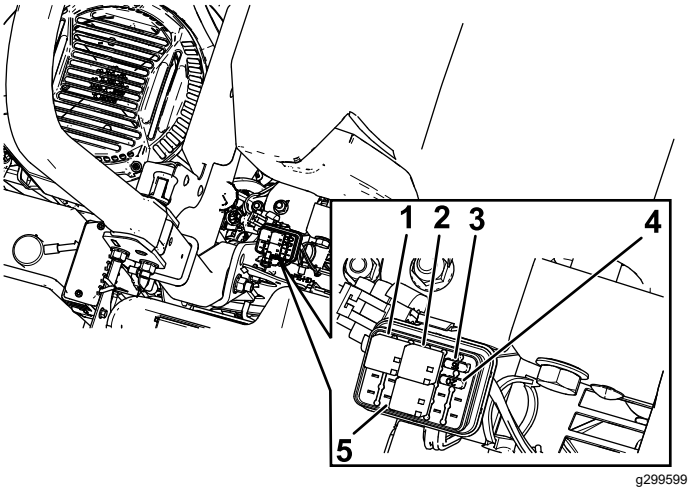

Figure 54

1. Engine power relay
2. Engine start relay
3. Accessory (15 A)
4. Power (20 A)
5. Fan relay

Adjusting the Tracking

1. Park the machine on a level surface, disengage the blade-control switch, and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Move the throttle midway between FAST and Slow.
4. Move both motion-control levers all the way forward until they both hit the stops in the T-slot.
5. Check which way the machine tracks.
   - If it tracks to the right, loosen the bolts and adjust the left stop plate rearward on the left T-slot until the machine tracks straight (Figure 55).
   - If it tracks to the left, loosen the bolts and adjust the right stop plate rearward on the right T-slot until the machine tracks straight (Figure 55).
6. Tighten the stop plate (Figure 55).

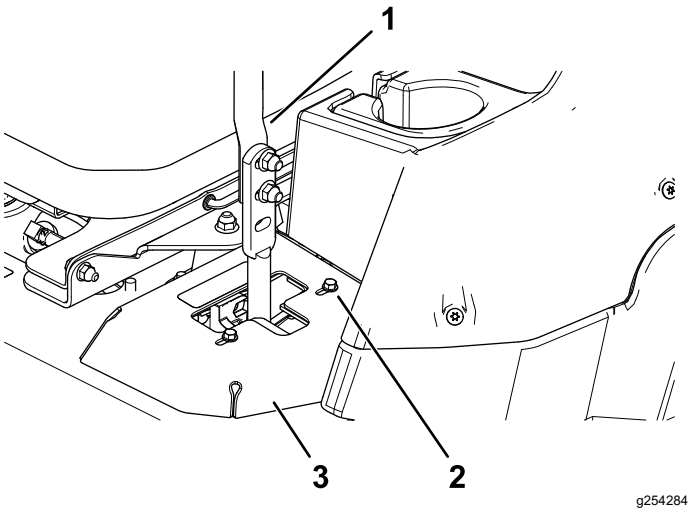

Figure 55

1. Control lever
2. Bolt
3. Stop plate

7. Align the levers in the front-to-rear position by bringing the levers together to the NEUTRAL position, and slide them until they are aligned, then tighten the bolts (Figure 56).

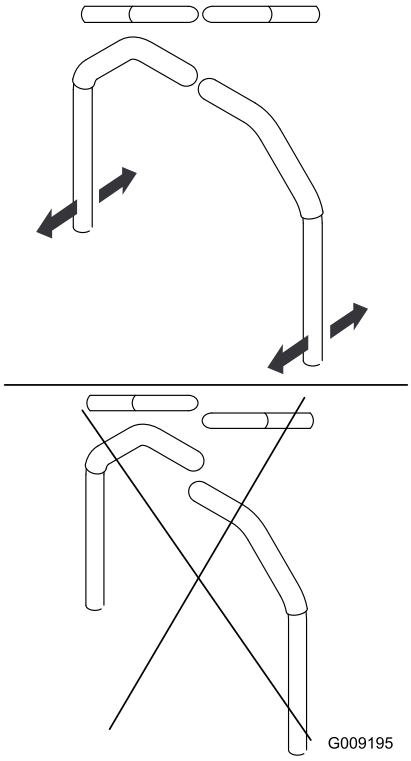

Figure 56

8. If alignment is needed, loosen the 2 motion-control lever mounting bolts on the misaligned side (Figure 57).

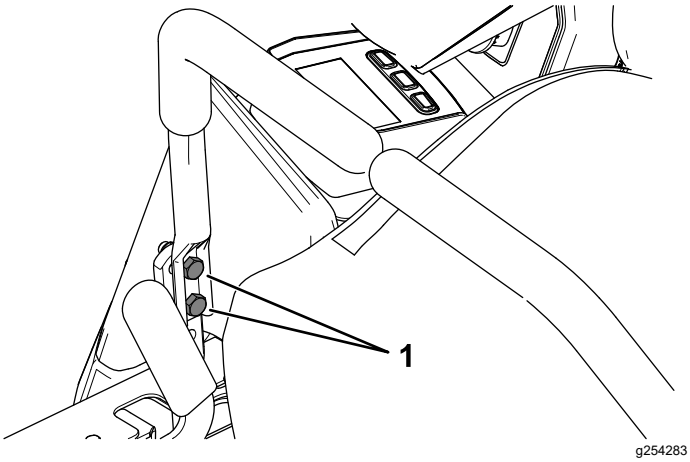

Figure 57

9. Move motion-control lever to meet the opposite side.
10. Tighten the 2 motion-control lever mounting bolts (Figure 57).

Checking the Tire Pressure

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

Drive tires pressure specification: 124 kPa (18 psi).

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

⚠ DANGER

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

Do not under-inflate the tires.

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

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

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

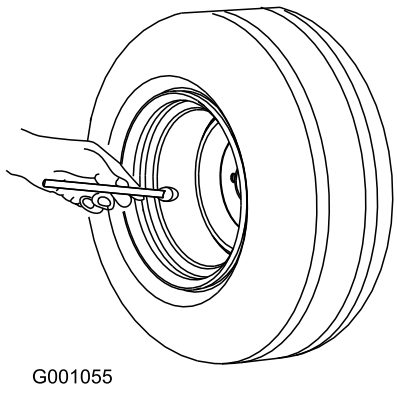

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Figure 58

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).

Checking the Wheel Hub Slotted Nut

Service Interval: After the first 100 hours

Every 500 hours thereafter

Torque the slotted nut to 420 to 461 N·m (310 to 340 ft-lb).

Note: Do Not use anti-seize on wheel hub.

Adjusting the Frame Caster-Pivot Bearing

Service Interval: Every 200 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 59).
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 59).

   Important: **Make sure that the spring washers are installed correctly as shown in Figure 59.**
5. Install the dust cap (Figure 59).

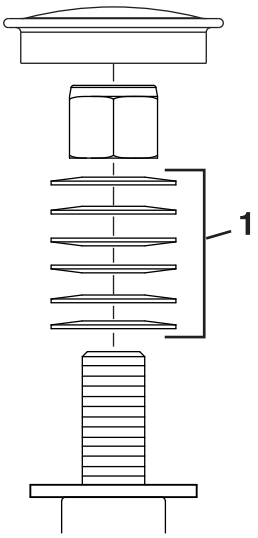

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Figure 59

1. Spring disc washers

Brake Maintenance

Adjusting the Parking Brake

Service Interval: After the first 100 hours

Every 500 hours

Check to ensure that parking brake is adjusted properly. This procedure must be followed after the first 100 hours or when a brake component has been removed or replaced.

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 31).
7. Ensure that the caliper is tightened to the transmission.
8. Disengage the parking brake.
9. Install the rear linkage to the bellcrank and pin using the spring clevis pin (Figure 60).

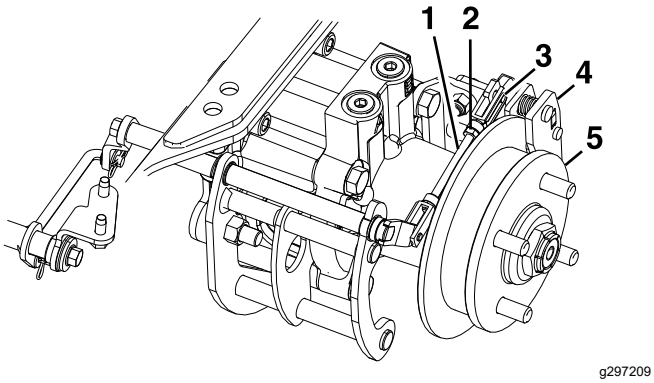

Figure 60

1. Rear linkage
2. Jam nut
3. Spring clevis pin
4. Caliper
5. Wheel hub

10. Push the caliper lever forward with finger pressure only enough to take up the caliper clearance to the hub (Figure 60).
11. Loosen the jam nut on the rear linkage.
12. Adjust the rear linkage to align the holes and install the spring clevis pin (Figure 60).
13. Tighten the jam nut on the rear linkage (Figure 60).
14. Ensure that the wheel hub moves freely between the caliper brake pads.
15. Repeats steps 9 to 14 for the right side.
16. Rotate the drive wheel release handle to the operating position; refer to Using the Drive-Wheel-Release Valves (page 31).
17. Install the rear tires and torque the lug nuts to 129 N·m (95 ft-lb).
18. Remove the jack stands.

Belt Maintenance

Inspecting the Belts

Service Interval: Every 50 hours

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

Replacing the Mower Belts

Replacing the Wing Deck Belts

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 2 lynch pins from the outer belt cover and remove the outer cover (Figure 61).
5. Rotate the inside belt cover upward (Figure 61).

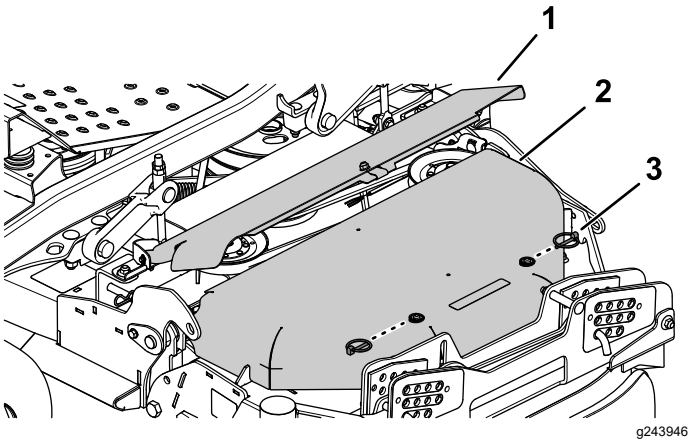

Figure 61

1. Inside belt cover
2. Outer belt cover
3. Lynch pin

6. Remove the floorboard.
7. Using a ratchet in the square hole in the idler arm, rotate the idler arm rearward to remove tension on the idler spring (Figure 62).
8. Remove the belt from the mower deck pulleys (Figure 62).

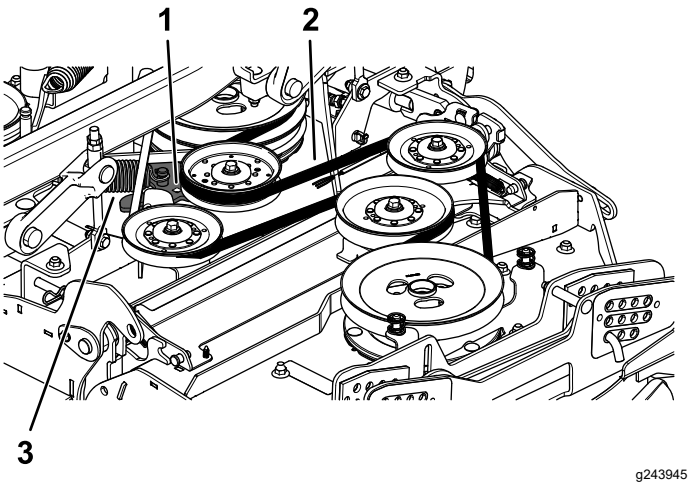

Figure 62

1. Square hole in the idler arm for the ratchet
2. Wing deck mower belt
3. Spring

9. Install the new belt around the mower deck pulleys.
10. Install the belt covers and floorboard.
11. Repeat this procedure for the other wing deck belt.

Replacing the Center Deck 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 2 wing deck belts; refer to Replacing the Wing Deck Belts (page 52).
5. Use a ratchet in the square hole in the idler arm to remove tension on the idler spring (Figure 63).
6. Remove the belt from the mower deck pulleys (Figure 63).

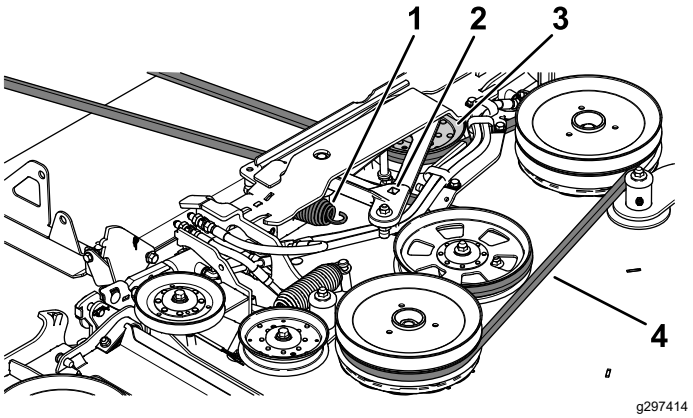

Figure 63

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

7. Install the new belt around the mower deck pulleys.
8. Install the 2 wing decks belts; refer to Replacing the Wing Deck Belts (page 52).
9. Install the belt covers and floorboard.

Controls System Maintenance

Adjusting the Control-Handle Position

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

1. Park the machine on a level surface, disengage the blade-control switch, and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Loosen the bolts and flange nuts installed in the levers (Figure 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).

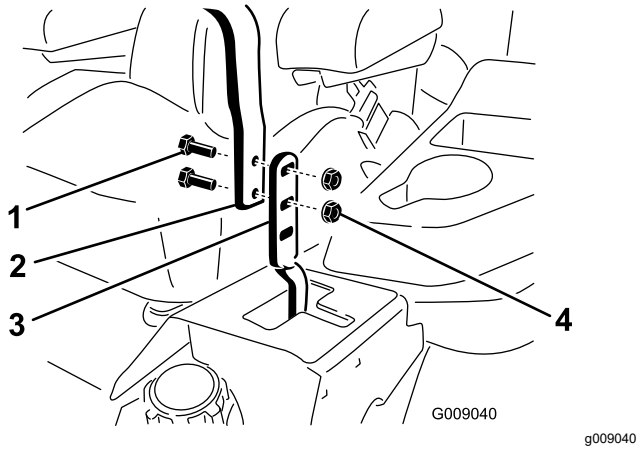

Figure 64

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

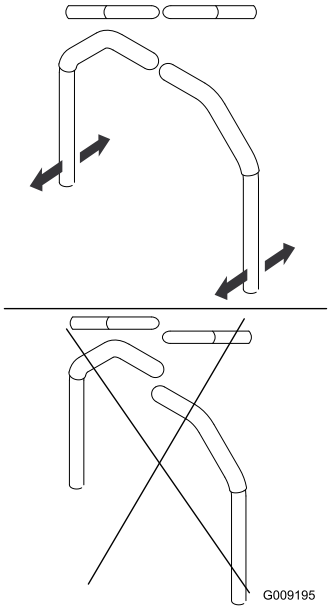

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Figure 65

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

Adjusting the Motion-Control Linkage

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

⚠ WARNING

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

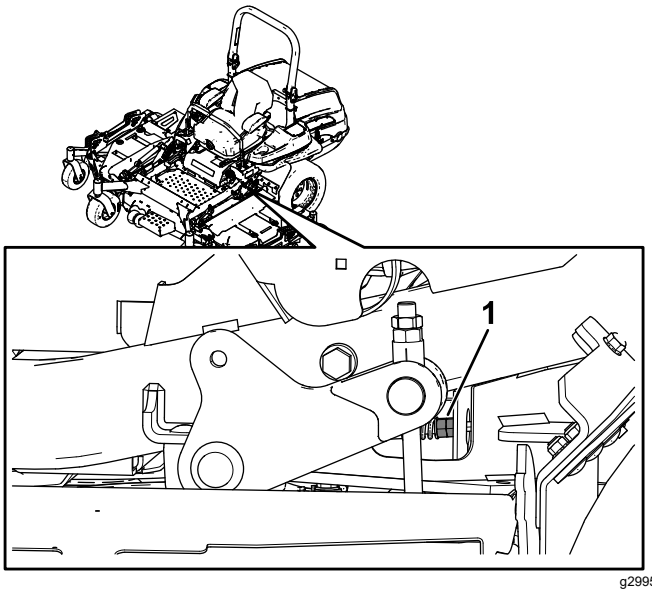
Keep your fingers, hands, and clothing clear of rotating components and hot surfaces.

1. Park the machine on a level surface, disengage the blade-control switch (PTO), move the motion-control levers to the NEUTRAL-LOCK position, and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Push the deck-lift pedal, 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).



g299537

Figure 66

1. Double nuts

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 mower 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.

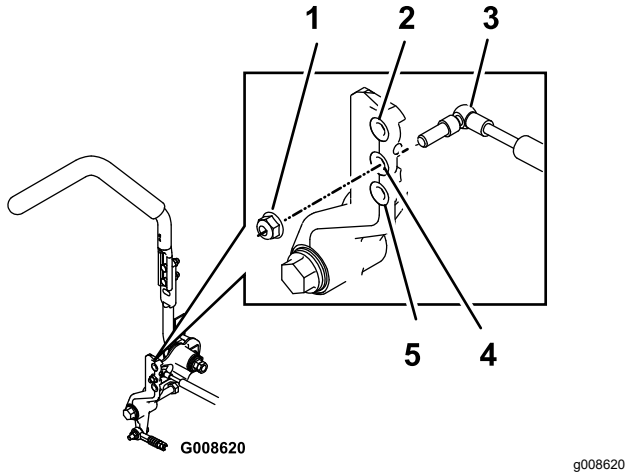


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Figure 67

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 system capacity for the deck-lift power unit: 710 ml (24 fl oz)

Recommended fluid for the deck-lift power unit: 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.)

Hydraulic system capacity for the hydro drives: 1.5 L (52 fl oz) per hydro drive

Recommended fluid for the hydro drives: Toro HYPR-OIL™ 500 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 for the hydro drives: If the Toro fluid is not available, Mobil® 1 15W50 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: Every 50 hours

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. Wait until the machine cools before checking the hydraulic fluid.
4. Adjust the seat to the most forward position to access the caps on the left and right hydro drives.
5. Clean the area around the hydraulic-reservoir cap and remove the cap.
6. Remove the dipstick and wipe it with a clean rag.
7. Place the dipstick into the filler neck, remove it, and check the fluid level (Figure 68).

   Note: If the level is not within the notched area of the dipstick, add enough Toro HYPR-OIL™ 500 fluid to raise the level to within the notched area.

   Important: **Do not overfill.**

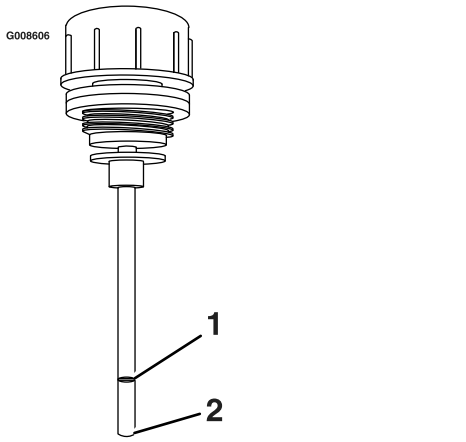

Figure 68

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 250 hours

Every 500 hours thereafter
(Every 250 hours if using Mobil 1 15W50 thereafter)

1. Disengage the PTO, move the motion-control levers to the NEUTRAL-LOCK position, and engage the parking brake.
2. 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.
3. Remove the pump-drive belt.
4. Place a drain pan under the left and right hydros.
5. Carefully clean area around the filters.

   It is important that no dirt or contamination enter the hydraulic system.
6. Using a socket, unscrew the filters to remove and allow the oil to drain.
7. Before installing the new filters, apply a thin coat of Toro HYPR-OIL™ 500 fluid on the surface of the 2 rubber seals.
8. Install the new filters and torque to 19 N·m (14 ft-lb).
9. 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.
10. Fill the hydraulic system; refer to Checking the Hydraulic-Fluid Level (page 56).

    Toro HYPR-OIL™ 500 fluid is recommended. Refer to the chart for an acceptable alternative:

Hydro Oil	Service Interval
Toro HYPR-OIL™ 500 fluid (preferred)	After first 250 hours *Every 500 hours thereafter
Mobil 1 15W50	After first 250 hours *Every 250 hours thereafter

    *May need more often under severe conditions.
11. Remove the drain pan and properly dispose of the hydraulic fluid and filter according to local codes.
12. Install the pump-drive belt.
13. Start engine and move throttle control to the FAST position.
14. Move the motion-control levers to full speed and run for 1 minute.

15. Shut off the machine, allow the hydros to cool, and check the fluid level.
16. Remove the reservoir cap and dipstick from the hydraulic-fluid tank.
17. Remove the jack stands.

Important: **Do cot change the hydraulic-system fluid (except for what can be drained when changing filter), unless the fluid is contaminated or has been extremely hot.**

Changing the fluid unnecessarily could damage hydraulic system by introducing contaminants into the system.

Checking the Deck-Lift Power Unit Fluid Level

Service Interval: Every 50 hours

Ensure that the fluid level is slightly above the internal gear pump in the tank (Figure 69).

Note: If needed, add Toro Premium Transmission/Hydraulic Tractor Fluid until the fluid level is slightly above the internal gear pump in the tank.

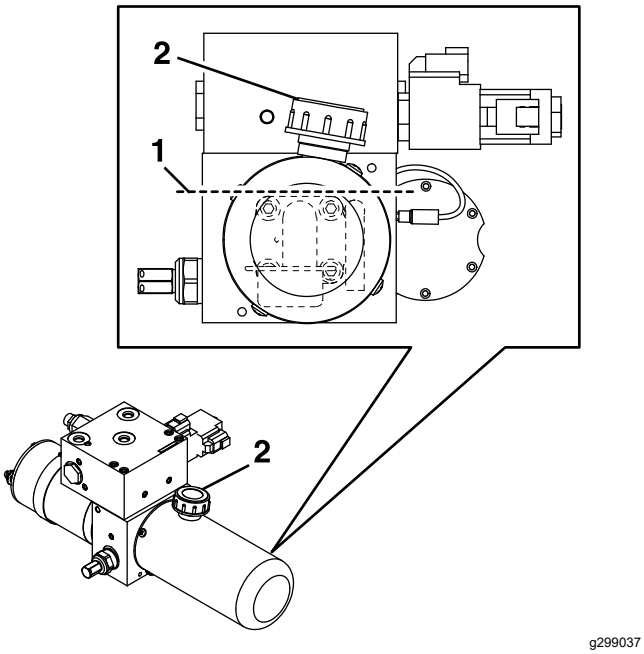

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Figure 69

1. Fluid level
2. Fill cap

Changing the Deck-Lift Power Unit Fluid

Service Interval: Yearly or before storage

1. Park the machine on a level surface, disengage the blade-control switch, and engage the parking brake.
2. Lower the mower deck to the 2.5 cm (1 inch) height of cut.
3. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
4. Open the hood to access the fluid reservoir.
5. Clean around the fill cap and remove the cap.
6. Extract the fluid through the fill port using a vacuum device or remove the power unit from the deck and pour the fluid out.
7. Install the power unit if you removed it to drain.
8. Add approximately 710 ml (24 fl oz) Toro Premium Transmission/Hydraulic Tractor Fluid and install the cap.

   Important: **Do not overfill the power unit; overfilling the power unit may damage it.**
9. Ensure that the fluid level is correct; refer to Checking the Deck-Lift Power Unit Fluid Level (page 57).

Mower Deck Maintenance

Blade Safety

- 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 one blade can cause other blades to rotate.
- Replace worn or damaged blades and bolts in sets to preserve balance.

Leveling the Mower Deck

Setting up the Machine

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

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

   If needed, adjust to 124 kPa (18 psi).
4. Position the mower to the 102 mm (4 inches) height-of-cut position.

Leveling the Center Deck and Wing Decks

1. Raise the center deck and fold the wings by pressing down at the rear of the deck-lift switch. Hold the switch down until both wings are completely folded.
2. Position the mower to the 102 mm (4 inches) height-of-cut position.
3. Unlock the left and right wing deck cam locks (Figure 70).
4. Remove and retain the wing deck height-of-cut lanyard (Figure 70).

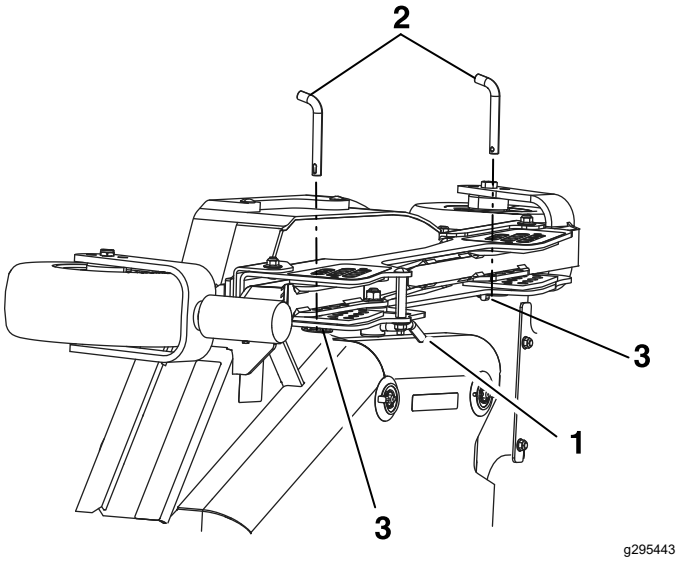

Figure 70

1. Cam lock
2. Clevis pin
3. Lanyard

5. Insert the height-of-cut pin into the 102 mm (4 inches) location and install the lanyard.
6. Lock the each wing deck cam lock.
7. Start the engine.

   Note: The parking brake must be engaged and the motion-control levers must be out to start the engine. The operator does not have to be in the seat. Ensure that all persons are clear of the deck wings.
8. Press and hold the front of the deck-lift switch until the center deck lowers and both wings are completely unfolded to the cutting height.
9. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
10. Measure from the level surface to the front tip of the left and right center deck blades (Figure 71).

    The measurement should read 102 mm (4 inches).

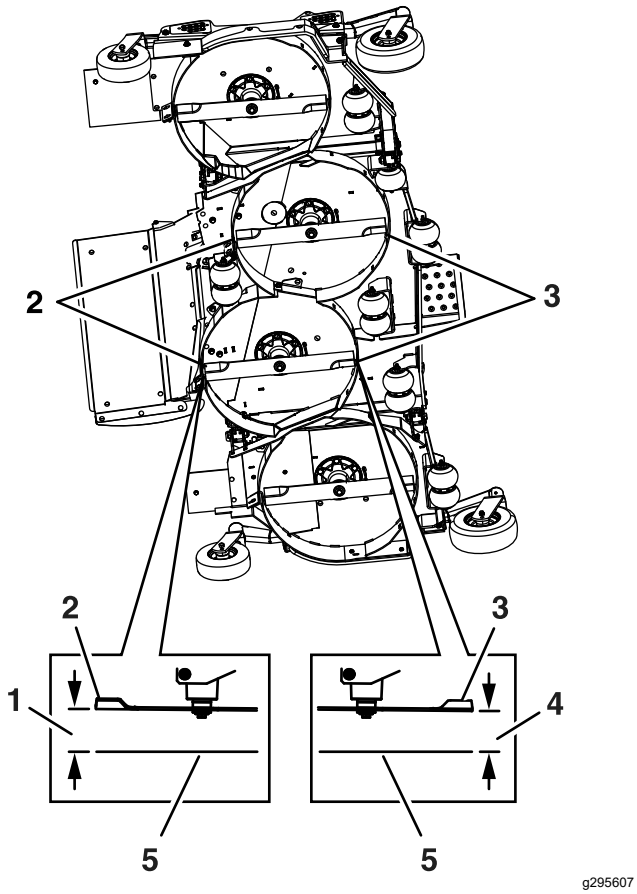

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Figure 71

1. 108 mm (4-1/4 inches)
2. Rear blade tip
3. Front blade tip
4. 102 mm (4 inches)
5. Level surface

Adjusting the Center Deck

1. To increase the cutting height, turn the adjuster screw clockwise; to decrease, turn it counterclockwise.

   Loosen the jam nuts on the top of each deck adjuster. Fine-tune the adjuster on the front deck-lift assembly by turning it to get the correct height for the left and right, front blade tips on the center deck (Figure 72).
2. Measure the rear tip height.

   Fine-tune the rear adjusters as required. You can adjust the single-point adjustment to gain more adjustment.
3. Measure until all 4 sides are at the correct height.
4. Tighten all the jam nuts on the deck-lift arm assemblies.
5. If the 4 deck adjusters (Figure 72) do not have enough adjustment to achieve the accurate height of cut with the desired rake, you can utilize the single-point adjustment to gain more adjustment.
6. To adjust the single-point system, first loosen the front and rear height-of-cut plate mounting bolts (Figure 72)

   Fine-tune the rear adjusters as required. You can adjust the single-point adjustment to gain more adjustment.

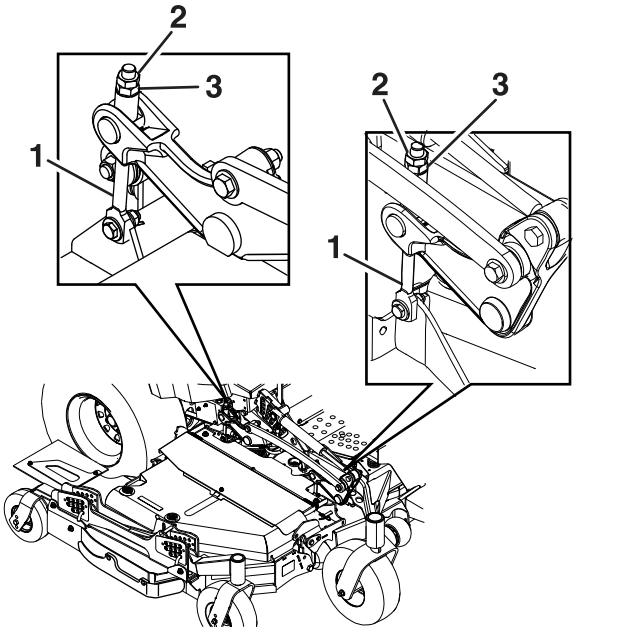

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Figure 72

1. Adjuster link
2. Jam nut
3. Adjuster

7. If the deck is too low, tighten the single-point adjustment bolt by rotating it clockwise (Figure 73).

   If the deck is too high, loosen the single-point adjustment bolt by rotating it counterclockwise. Loosen the front and rear height-of-cut plate mounting bolts. Fine-tune the rear adjusters as required. You can adjust the single-point adjustment to gain more adjustment.

   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 will attain some up and down adjustment on each of the 4 deck links.

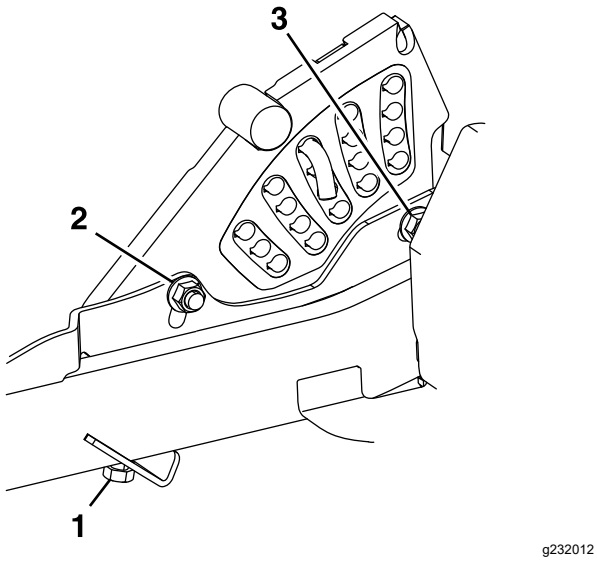

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Figure 73

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

8. Torque the front and rear height-of-cut plate mounting bolts to 37 to 45 N·m (27 to 33 ft-lb).

Adjusting the Wing Decks

1. Measure from the level surface to the front tip of the left wing deck blade.

   Note: The measurement should read 102 mm (4 inches).

2. Measure from the level surface to the front tip of the right wing deck blade.

   Note: The measurement should read 102 mm (4 inches).

   Note: As with the center deck, in most conditions, you should adjust the rear tips on the wing blades 6.4 mm (1/4 inch) higher than the front.

3. The left and right wing decks have blade height adjustments with front and rear adjustment points. To adjust the wing-blade height, first loosen the front and rear height-of-cut hanger mounting nuts. There are 4 locations (2 on each side of the channel) as shown in Figure 74.

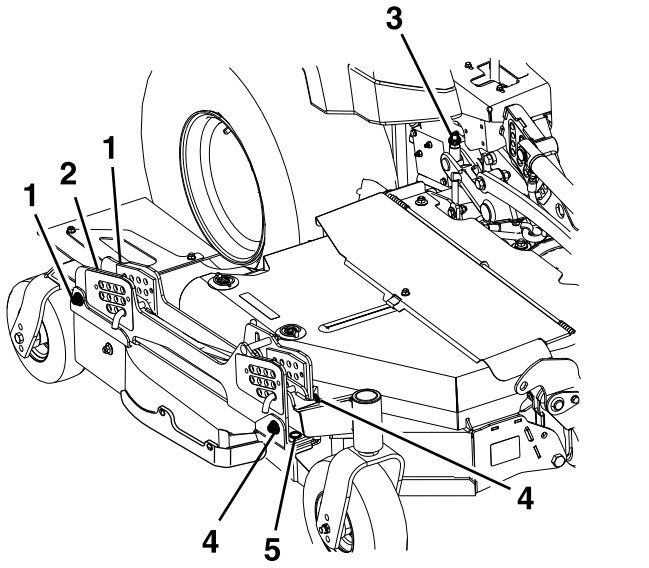

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Figure 74

Right wing deck shown

1. Rear hanger-mounting nuts
2. Rear height-adjustment hardware location
3. Single-point rear adjustment
4. Front hanger-mounting nuts
5. Front height-adjustment hardware location

   - If the deck is too low, tighten the front height-adjustment bolt (Figure 74) by rotating the bottom nut clockwise.
   - If the deck is too high, loosen the front height-adjustment bolt (Figure 74) by rotating the bottom nut counterclockwise. Fine-tune the rear adjusters as required.

   Adjust the rear wheel height (Figure 74) so that the rear wheel lightly touches the ground with minimal pressure.

4. Measure the back of the wing blades. If either has less than 1.5 mm (1/16 inch) rake, raise the rear of the deck by tightening the left and right rear adjustments (Figure 74) until all 4 blades have a minimum of 1.5 mm (1/16 inch) rake. Adjust the rear wing wheels so that they lightly touch the ground with minimal pressure. Tighten all 4 rear hanger-mount locations (Figure 74).

5. Tighten the front and rear height-of-cut hanger jam nuts.

Servicing the Cutting Blades

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

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 75).
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 75).

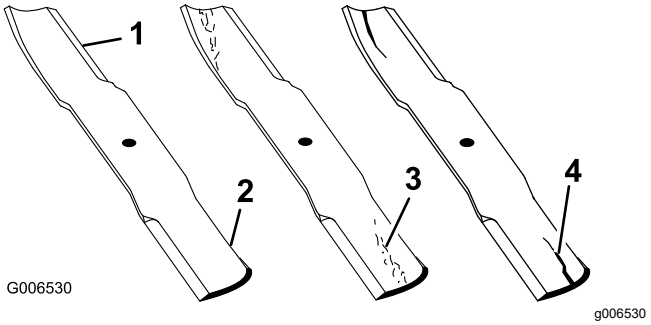

Figure 75

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

Checking for Bent Blades

1. Disengage the blade-control switch (PTO), move the motion-control levers to the NEUTRAL-LOCK position, and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Rotate the blades until the ends face forward and backward (Figure 76).
4. Measure from a level surface to the cutting edge, position **A**, of the blades (Figure 76).

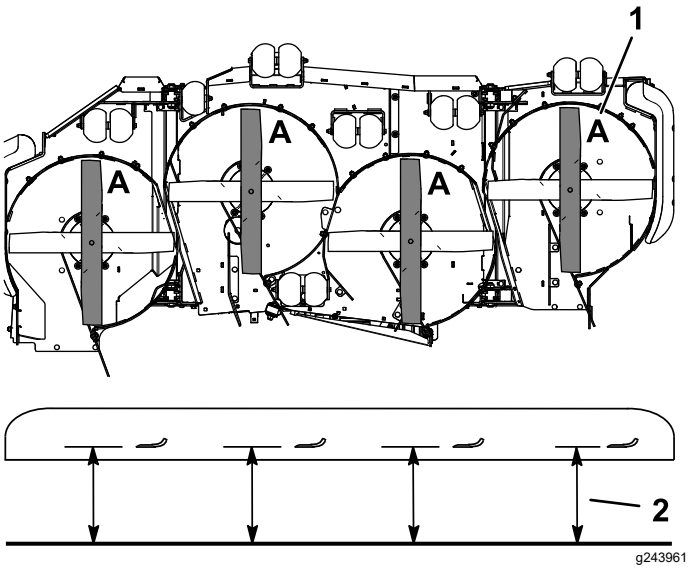

Figure 76

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

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

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

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

⚠ DANGER

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

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

Removing the Blades

Replace 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).

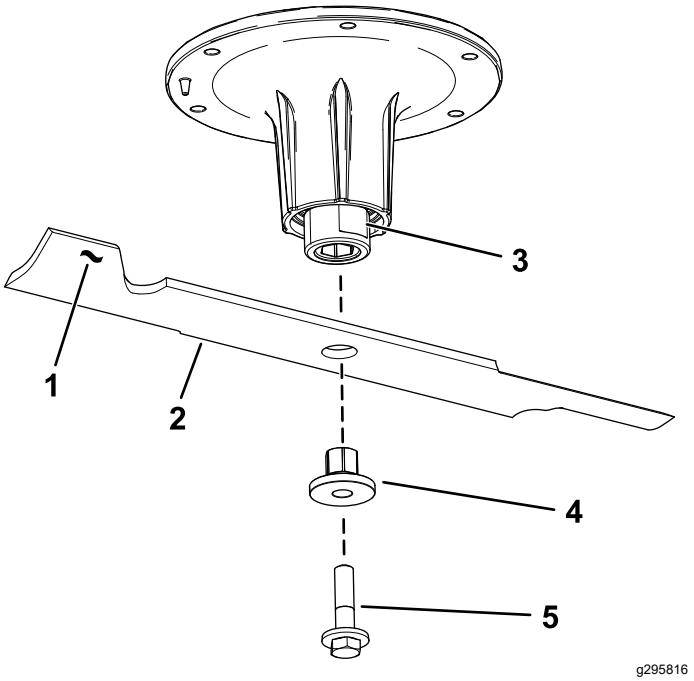

Figure 77

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.

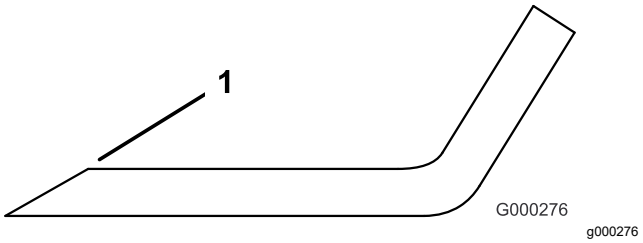

Figure 78

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).

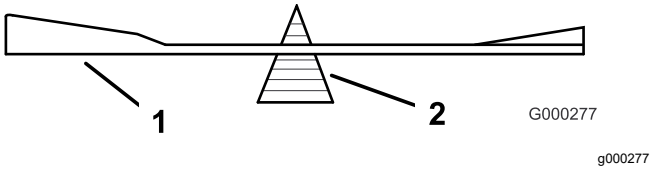

Figure 79

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).

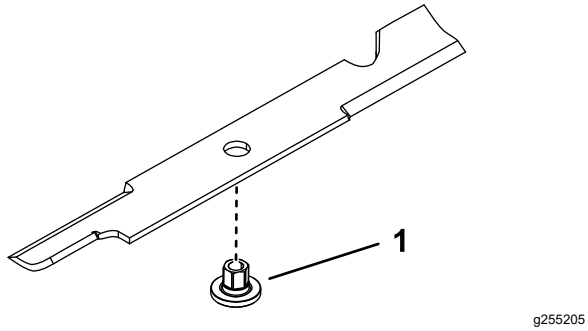

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Figure 80

1. Bushing

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

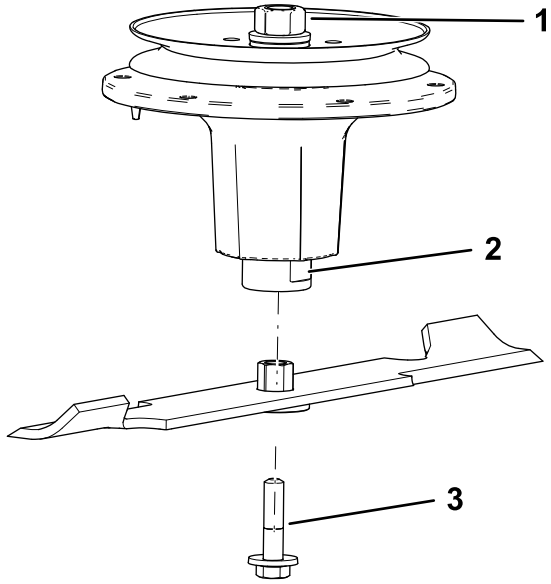

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Figure 81

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).

Checking the Wing Deck Bushings

Service Interval: Every 100 hours

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. Raise the center deck and fold the wings by pressing down the deck-lift switch.

   Hold the switch down until both wing decks are completely folded.
4. Push on the front corners of the deck near the lower bushings.

   If the there is more than 3 mm (1/8 inch) of movement, you need to replace the bushings.

Changing the Wing Deck Bushings

1. Disengage the blade-control switch (PTO), move the motion-control levers to the NEUTRAL-LOCK position, and engage the parking brake.
2. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Remove and retain the clevis pins and hairpin cotters from each wing deck storage location.
4. Ensure that all persons are clear of the deck wings.
5. Press and hold the top of the deck-control switch; the center deck will raise first, then the wing decks.
6. Secure each wing deck in the upright position using the clevis pins and hairpin cotters.
7. Loosen the bolts that secure the upper pivot pins to the deck but **do not** remove the bolts (Figure 82).

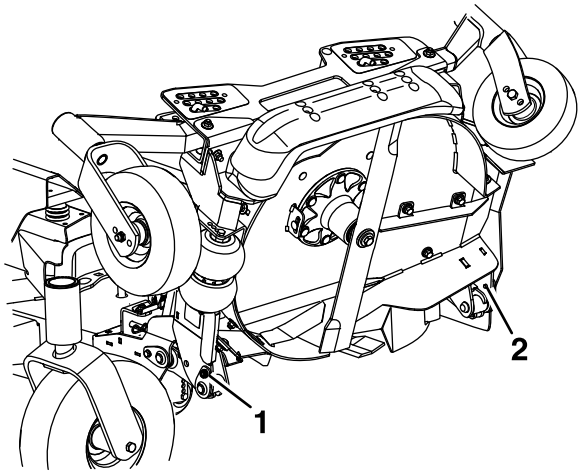

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Figure 82

1. Front pivot pin
2. Rear pivot pin

8. Remove and retain the clevis pins and hairpin cotters from each wing deck.

   Remove the height-of-cut pin from the deck-lift plate on the right side of the center deck.
9. Lower the wing decks, but **do not** draw them into the operating position.
10. Remove and retain the left and right wing deck belt shield lynch pins, belt shield, and wing deck belts.
11. Remove and retain the locking cotter pins and cylinder pins that attach to the rod end of the deck-fold cylinders and wing decks (Figure 83).

Note: Do not pull the wing decks into the operating position in order to remove the cylinder pins.

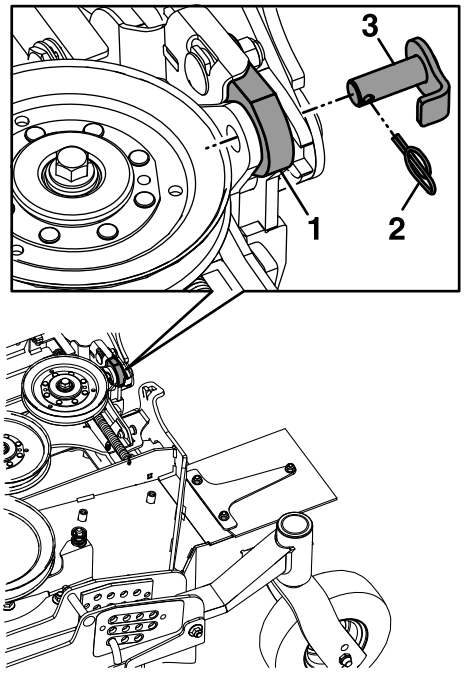

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Figure 83

1. Cylinder rod end
2. Cotter pin
3. Cylinder pin

12. Remove and retain the bolts that secure the upper pivot pins to the deck and then remove the pivot pins (Figure 84).

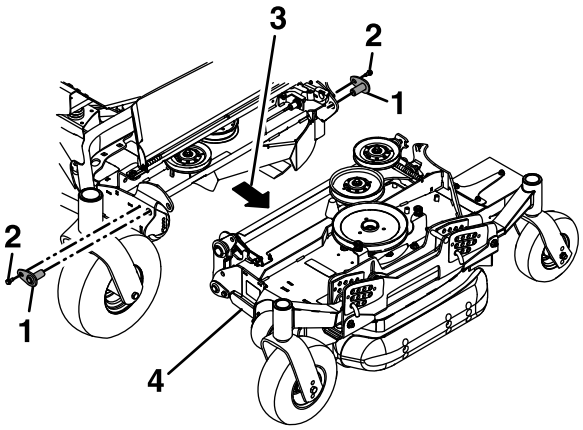

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Figure 84

1. Upper pivot pins
2. Bolt
3. Pull outward
4. Left wing deck

13. Pull the wing deck outward to separate it from the center deck section (Figure 84).
14. Remove the flanged bushings from the upper pivot points and clean the bore (Figure 85).

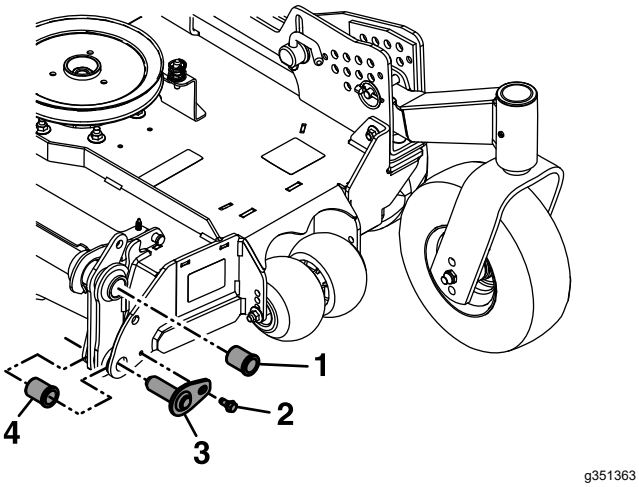

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Figure 85

1. Upper pivot point bushing
2. Lower pivot point bolt
3. Deck pin assembly
4. Bushing

15. Apply a thin bead of Loctite® 680 to the entire circumference of the rear edge of the new bushings.
16. Insert and gently tap the new bushings into the opening and properly seat them into place.
17. Place a block of wood under the inside edge of the center deck to make it easier to work on the lower pivot point bushings.
18. Remove and retain the lower pivot point bolts (Figure 82 and Figure 85).
19. Remove and discard the flanged bushing from the front and rear of the wing deck and clean the bore.
20. Apply a thin bead of Loctite® 680 to the entire circumference of the rear edge of the new bushings.
21. Insert and gently tap the new bushings into the opening and properly seat them into place.
22. Install the lower deck pin assemblies and bolts into the lower deck pivot points and hand-tighten.
23. To ease installing the wing deck sections, carefully remove the exposed end of the spring that applies pressure to the rear of the wing deck cover (Figure 86).

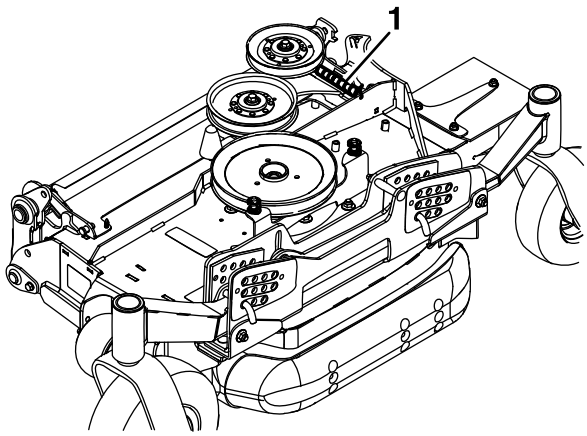

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Figure 86

1. Spring

24. Push the left wing deck back to the center deck.

    Align and install the upper pivot deck pins in the front and rear of the deck and secure it using the previously removed bolts (Figure 84).
25. Align the lift-cylinder arm and install the previously removed pin and ensure that the locking tab aligns with the associated opening in the mount.

    Install the locking cotter pin to secure.
26. Attach the spring that was removed in step 23 that applies pressure to the rear of the wing deck cover.
27. Install the wing deck belts.
28. Install the wing deck belt shields and secure them using the lynch pins.
29. Raise the wing decks to the TRANSPORT position and secure them using the clevis pins and hairpin cotters.
30. Install the height-of-cut pin.

Adjusting the Wing Deck Caster-Pivot Bearings

Service Interval: Every 200 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 87).
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 87).

   Important: **Make sure that the spring washers are installed correctly as shown in Figure 87.**
5. Install the dust cap (Figure 87).

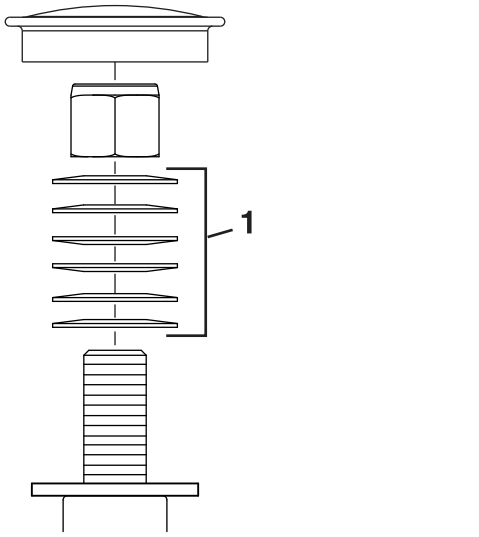

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Figure 87

1. Spring disc washers

Cleaning

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 center deck and wing decks. Lock each wing deck in the upright position.
5. Clean out any grass build-up from the underside of deck and in the discharge deflector.

Cleaning the Hydro Fan Cooling Guards, Hydro Cooling Fins, and Fan

Service Interval: Before each use or daily

Remove the debris from the hydro fan cooling guards, hydro cooling fins, and fan to allow the hydro system to run cooler and improve the life of the hydro system.

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. Slide the seat all the way back, lift the seat to access the left and right hydro drives area.
4. Remove any debris from the hydro fan cooling guards, hydro cooling fins, and fan.

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, and wait for all moving parts to stop before you leave the operator's position. Allow the machine to cool before adjusting, servicing, cleaning, or storing it.
- Do not store the machine or fuel near flames or drain the fuel indoors or inside an enclosed trailer.
- Do not store the machine or fuel container where there is an open flame, spark, or pilot light, such as on a water heater or on other appliances.

Cleaning and Storing the Machine

1. Disengage the blade-control switch (PTO), engage the parking brake, turn the ignition key to the OFF position, and remove the key.
2. Remove grass clippings, dirt, and grime from the external parts of the entire machine, especially the engine and hydraulic system. Clean dirt and chaff from the outside of the engine cylinder head fins and blower housing.

   Important: **You can wash the machine with mild detergent and water. Do not pressure wash the machine. Avoid excessive use of water, especially near the control panel, engine, hydraulic pumps, and motors.**
3. Check the brake; refer to Brake Maintenance (page 51).
4. Service the air cleaner; refer to Servicing the Air Cleaner (page 39).
5. Grease the machine; refer to Lubrication (page 35).
6. Change the engine oil and filter; refer to Servicing the Engine Oil (page 40).
7. Check the tire pressure; refer to Checking the Tire Pressure (page 50).
8. Change the hydraulic fluid and filter; refer to Changing the Hydraulic Fluid and Filter (page 56).
9. Charge the battery; refer to Charging the Battery (page 47).
10. Scrape any heavy buildup of grass and dirt from the underside of the mower, then wash the mower with a garden hose.

    Note: Run the machine with the blade-control switch (PTO) engaged and the engine at high idle for 2 to 5 minutes after washing.
11. Check the condition of the blades; refer to Servicing the Cutting Blades (page 61).

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

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

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

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

    C. Dispose of fuel properly. Recycle according to local codes.

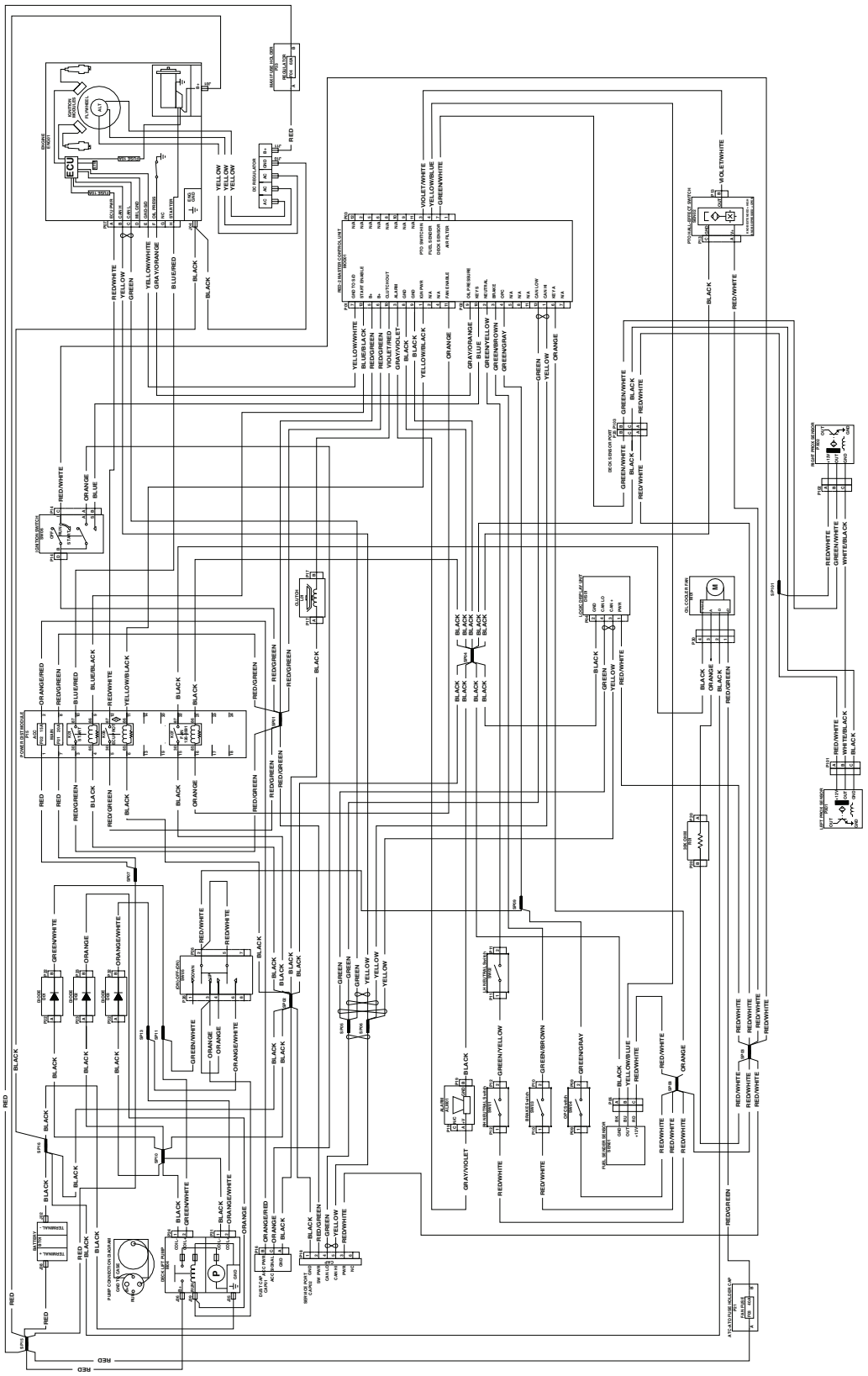
       Important: **Do not store stabilizer/conditioned fuel longer than the duration recommended by the fuel-stabilizer manufacturer.**
12. Check and tighten all bolts, nuts, and screws. Repair or replace any part that is damaged.
13. Paint all scratched or bare metal surfaces. Paint is available from your Authorized Service Dealer.
14. Store the machine in a clean, dry garage or storage area. Remove the key from the ignition switch and keep it out of reach of children or other unauthorized users. Cover the machine to protect it and keep it clean.

Troubleshooting

Problem	Possible Cause	Corrective Action
The starter does not crank.	1. The blade-control switch (PTO) is engaged. 2. The parking brake is not engaged. 3. The drive levers are not in the NEUTRAL-LOCK position. 4. The operator is not seated. 5. The battery is dead. 6. The electrical connections are corroded or loose. 7. The fuse is blown. 8. The relay or switch is broken.	1. Move the blade-control switch (PTO) to disengaged. 2. Engage the parking brake. 3. Ensure that the drive levers are in the NEUTRAL-LOCK position. 4. Sit on the seat. 5. Charge the battery. 6. Check the electrical connections for good contact. 7. Replace the fuse. 8. Contact an Authorized Service Dealer.
The engine does not start, starts hard, or fails to keep running.	1. The fuel tank is empty. 2. The oil level in the crankcase is low. 3. The throttle is not in the correct position. 4. There is dirt in fuel filter. 5. There is dirt, water, or stale fuel is in the fuel system. 6. The air cleaner is dirty. 7. The seat switch is not functioning properly. 8. The electrical connections are corroded, loose or faulty. 9. The relay or switch is broken.	1. Fill the fuel tank. 2. Add oil to the crankcase. 3. Be sure that the throttle control is midway between the SLOW and FAST positions. 4. Replace the fuel filter. 5. Contact an Authorized Service Dealer. 6. Clean or replace the air-cleaner element. 7. Check the seat switch indicator. Replace the seat if needed. 8. Check the electrical connections for good contact. Clean the connector terminals thoroughly with electrical contact cleaner, apply dielectric grease, and connect. 9. Contact an Authorized Service Dealer.
The engine loses power.	1. The engine load is excessive. 2. The air cleaner is dirty. 3. The oil level in the crankcase is low. 4. The cooling fins and air passages above the engine are plugged. 5. The vent hole in the fuel cap is plugged. 6. There is dirt in the fuel filter. 7. There is dirt, water, or stale fuel is in the fuel system.	1. Reduce the ground speed. 2. Clean the air-cleaner element. 3. Add oil to the crankcase. 4. Remove the obstruction from the cooling fins and air passages. 5. Clean or replace the fuel cap. 6. Replace the fuel filter. 7. Contact an Authorized Service Dealer.
The engine overheats.	1. The engine load is excessive. 2. The oil level in the crankcase is low. 3. The cooling fins and air passages above the engine are plugged.	1. Reduce the ground speed. 2. Add oil to the crankcase. 3. Remove the obstruction from the cooling fins and air passages.
The machine does not drive.	1. The by pass valves are not closed tight. 2. The pump belt is worn, loose or broken. 3. The pump belt is off a pulley. 4. The idler spring is broken or missing. 5. The hydraulic-fluid level is low or too hot.	1. Tighten the by pass valves. 2. Change the belt. 3. Change the belt. 4. Replace the spring. 5. Add hydraulic fluid to reservoirs or let it cool down.

Problem	Possible Cause	Corrective Action
The machine pulls 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. 3. The reverse indicator and motion-control linkage need adjustment.	1. Adjust the tracking. 2. Adjust the tire pressure in the drive tires. 3. Adjust the reverse indicator and the motion-control linkage.
There is abnormal vibration.	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.
Mowing is resulting in uneven cutting height.	1. The blade(s) is/are not sharp. 2. The cutting blade(s) is/are bent. 3. The mower deck is not level. 4. The underside of mower is dirty. 5. The tire pressure is not correct. 6. The blade spindle bent.	1. Sharpen the blade(s). 2. Install new cutting blade(s). 3. Level the mower deck from side-to-side and front-to-rear. 4. Clean the underside of the mower. 5. Adjust the tire pressure. 6. Contact an Authorized Service Dealer.
The blades do not rotate.	1. The drive belt is worn, loose, or broken. 2. The drive belt is off the pulley. 3. The deck belt is worn, loose, or broken. 4. The deck belt is off the pulley. 5. There is a broken or missing idler spring. 6. The clutch has disengaged. 7. The wing decks are not fully lowered.	1. Check the belt tension. 2. Check belt for damage; replace if necessary. Install the drive belt and check the belt guide for the correct position. 3. Install a new deck belt. 4. Install the deck pulley, idler pulley, idler arm, and spring for correct position and function. 5. Replace the idler spring. 6. The engine has overheated; determine the cause of overheating. 7. Lower the wing decks.
The clutch does not engage.	1. A fuse is blown. 2. There is low voltage supply at the clutch. 3. There is an inadequate current supply. 4. Engine has overheated. 5. The wing decks are not fully lowered.	1. Replace the fuse. Check the coil resistance, battery charge, charging system, and wire connections. Replace if necessary. 2. Check the coil resistance, battery charge, charging system, and wire connections. Replace if necessary. 3. Repair or replace the clutch-lead wire or electrical system. Clean the connector contacts. 4. The engine has overheated; determine the cause of overheating. 5. Lower the wing decks.
The deck will not raise or lower.	1. The operator is not seated. 2. The key is not in the RUN position. 3. The fluid level is low.	1. Sit on the seat. 2. Turn the key to RUN position. 3. Check the fluid level.

Schematics



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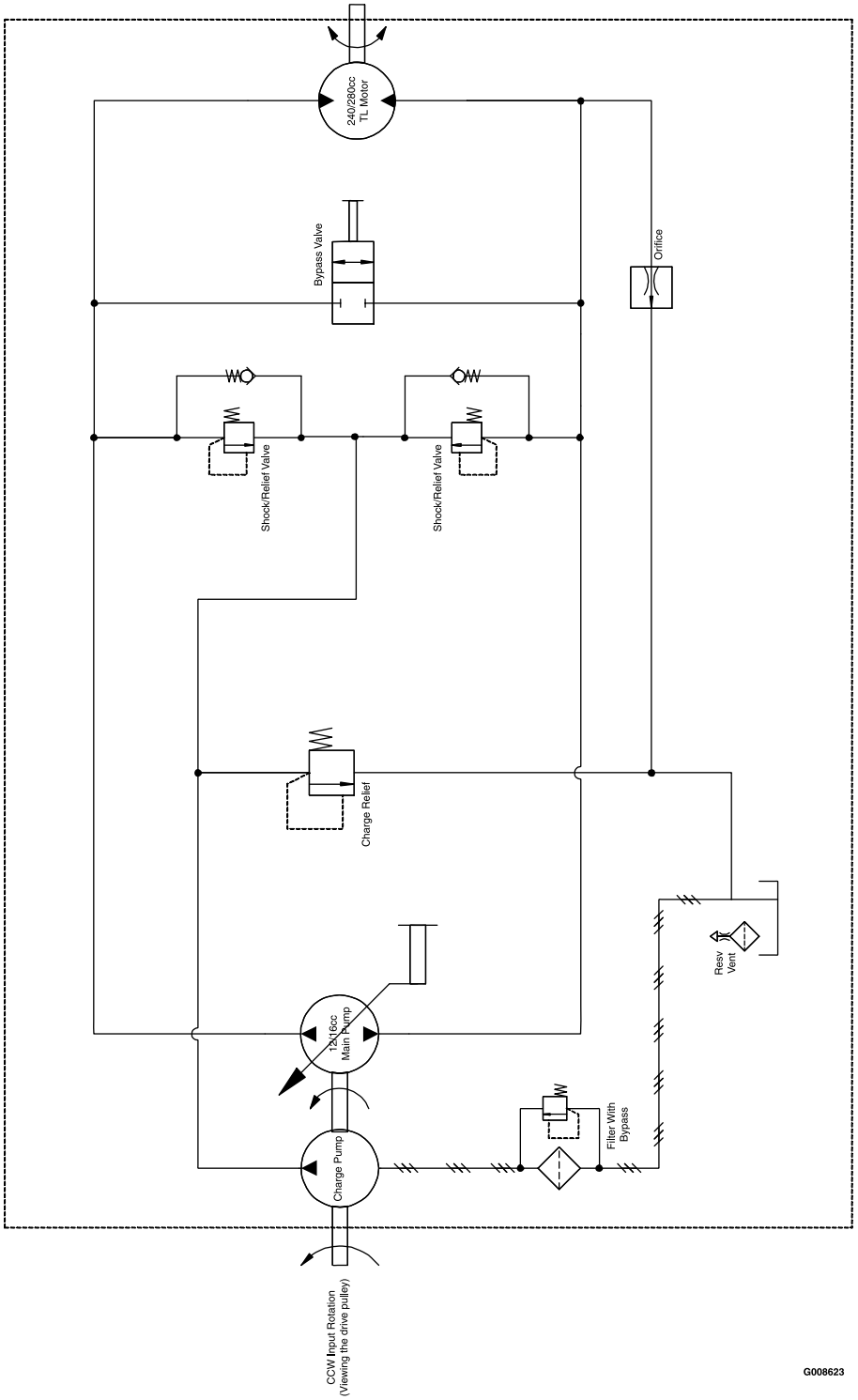
Electrical Schematic—Machine with Horizon Display Monitor (Rev. A)



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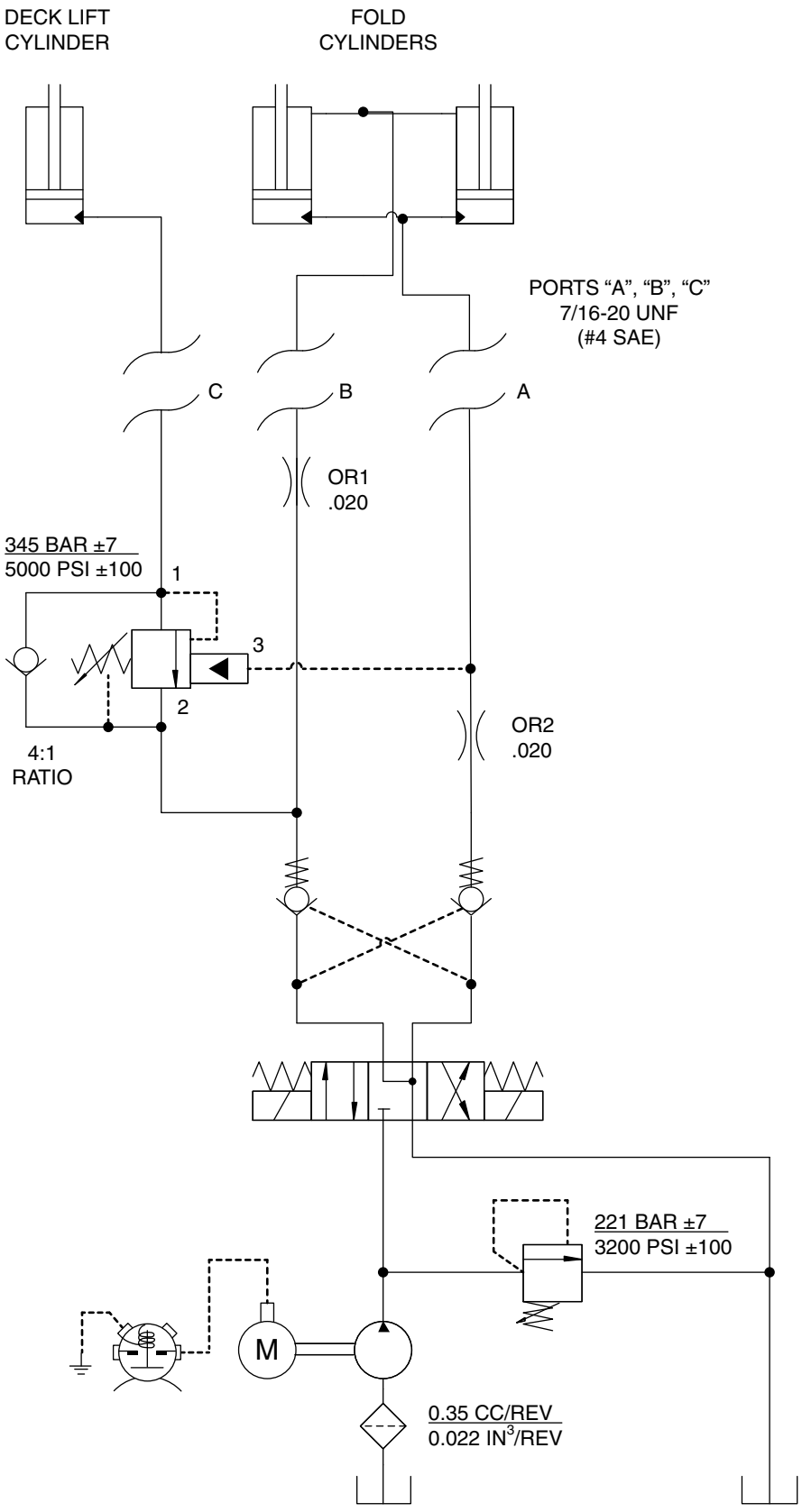
Hydraulic Schematic (Rev. A)



Wing Deck Lift Hydraulic Diagram (Rev. A)

Notes:

Notes:

California Proposition 65 Warning Information

What is this warning?

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

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

What is Prop 65?

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

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

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

Does this law apply everywhere?

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

How do the California warnings compare to federal limits?

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

Why don't all similar products carry the warning?

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

Why does Toro include this warning?

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