Form No. 3409-600 Rev B

TORO®

Count on it.

Operator's Manual

Groundsmaster® 7210 Series Traction Unit

Model No. 30695—Serial No. 400000000 and Up

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

3409-600 B

⚠ WARNING

CALIFORNIA
Proposition 65 Warning

This product contains a chemical or chemicals known to the State of California to cause cancer, birth defects, or reproductive harm.

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

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.

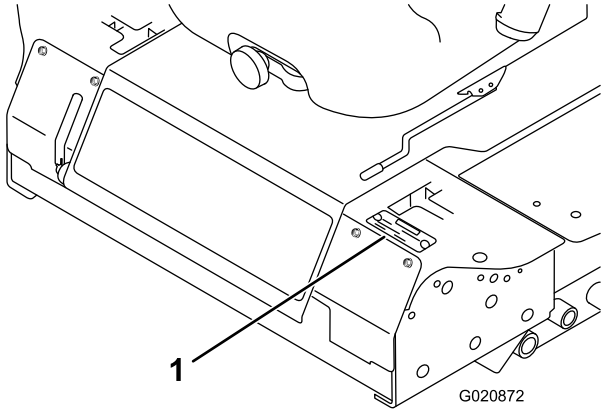
Introduction

This machine is a ride-on, rotary-blade lawn mower intended to be used by professional, hired operators in commercial applications. It is primarily designed for cutting grass on well-maintained lawns in parks, sports fields, and on commercial grounds. It is not designed for cutting brush, mowing grass and other growth alongside highways, or for agricultural uses.

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

You may contact Toro directly at www.Toro.com for product and 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.



g020872

Figure 1

1. Model and serial number location

Model No. _____

Serial No. _____

This manual identifies potential hazards and has safety messages identified by the safety alert symbol (Figure 2), which signals a hazard that may cause serious injury or death if you do not follow the recommended precautions.



g000502

Figure 2

1. Safety alert symbol

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

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Safety

This machine has been designed in accordance with ANSI B71.4–2012.

General Safety

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

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

- Read and understand the contents of this *Operator's Manual* before starting the engine.
- Do not put your hands or feet near moving components of the machine.
- Do not operate the machine without all guards and other safety protective devices in place and working on the machine.
- Keep clear of any discharge opening. Keep bystanders and pets a safe distance away from the machine.
- Keep children out of the operating area. Never allow children to operate the machine.
- Stop the machine and shut off the engine before servicing, fueling, or unclogging the machine.
- Avoid sudden starts and stops, holes, dropoffs, and hidden hazards in the terrain.
- For braking, move the control levers to the neutral position or to the direction opposite the travel direction.

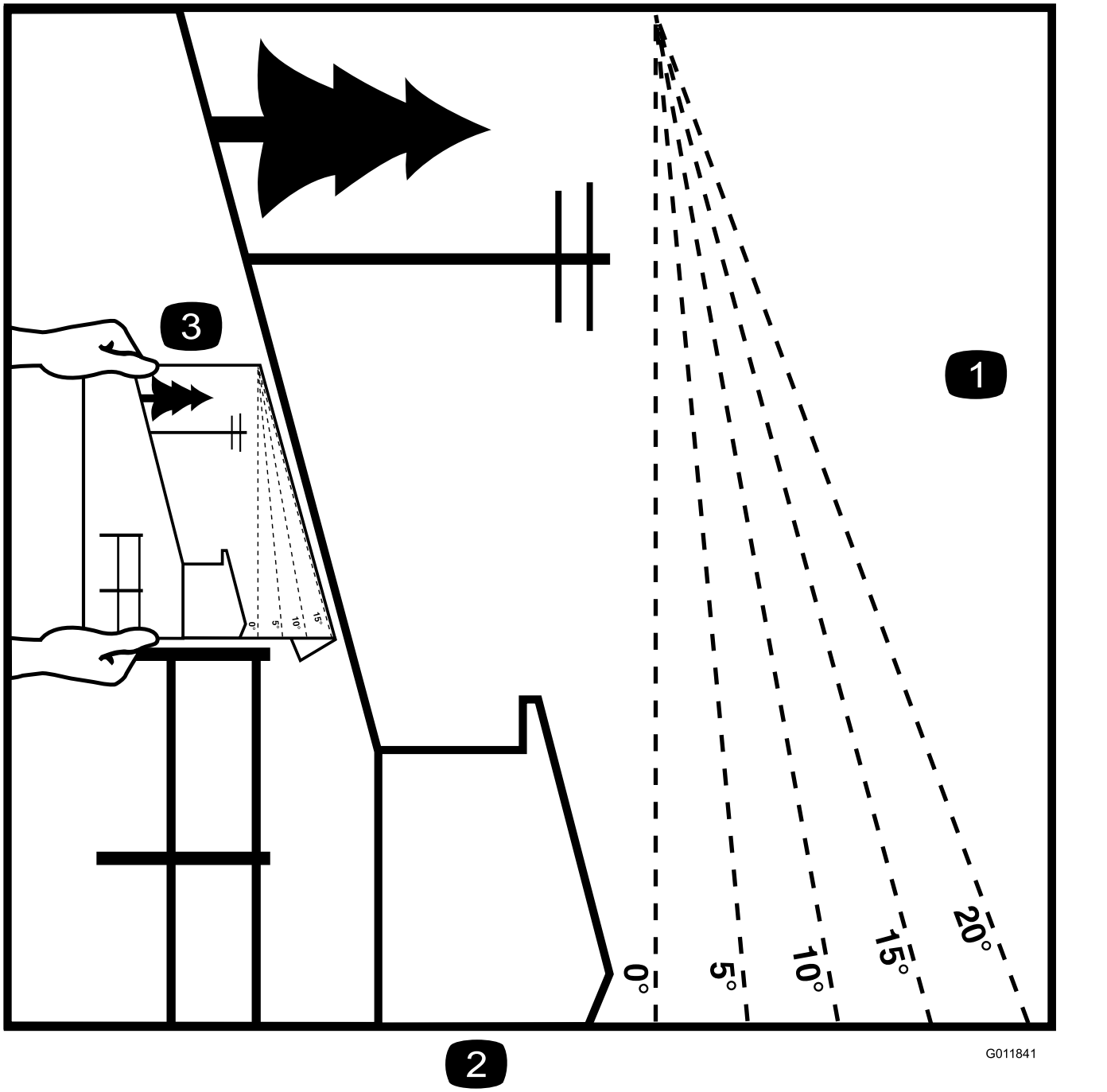
Improperly using or maintaining this machine can result in injury. To reduce the potential for injury, comply with these safety instructions and always pay attention to the safety-alert symbol, which means Caution, Warning, or Danger—personal safety instruction. Failure to comply with these instructions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

You can find additional safety information where needed throughout this *Operator's Manual*.

Engine Emission Certification

The engine in this machine is EPA Tier 4 Final and stage 3b compliant.

Slope Indicator



g011841

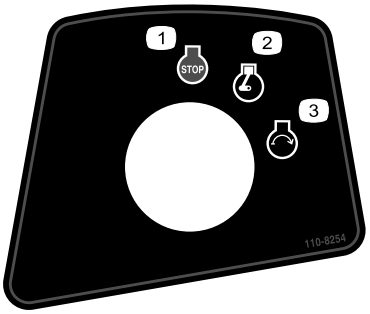
Figure 3

This page may be copied for personal use.

1. The maximum slope you can safely 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

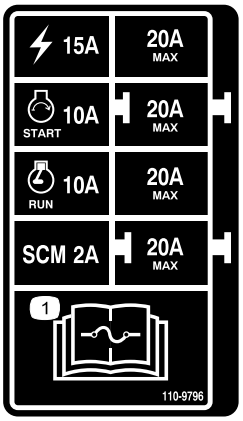
Safety decals and instructions are easily visible to the operator and are located near any area of potential danger. Replace any decal that is damaged or lost.



decal110-8254

110-8254

1. Engine–Stop
2. Engine—Run
3. Engine—Start



decal110-9796

110-9796

1. Read the *Operator's Manual* for information on fuses.



decal93-6687

93-6687

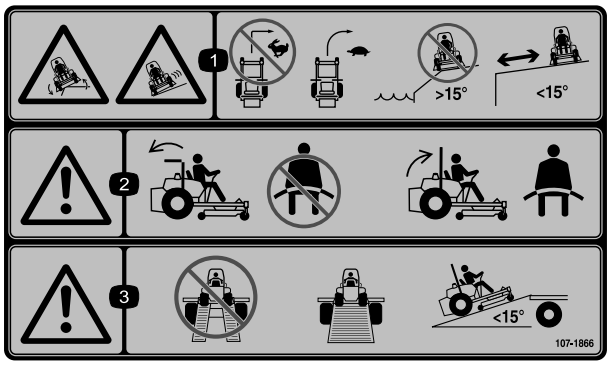
1. Do not step here.



decal93-6697

93-6697

1. Read the *Operator's Manual*.
2. Add SAE 80w-90 (API GL-5) oil every 50 hours.



decal107-1866

107-1866

1. Tipping hazard and sliding or loss of control hazard, drop-offs—do not turn sharply while traveling fast, instead, slow down and turn gradually, do not operate the machine near drop-offs, slopes greater than 15 degrees, or water; keep a safe distance from drop-offs.
2. Warning—if the roll bar is lowered, do not wear the seat belt, if the roll bar is raised, wear the seat belt.
3. Warning—do not use split ramps, use a full ramps when transporting machine, only use ramps with inclines less than 15 degrees.



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 a safe distance 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.



decal117-2718

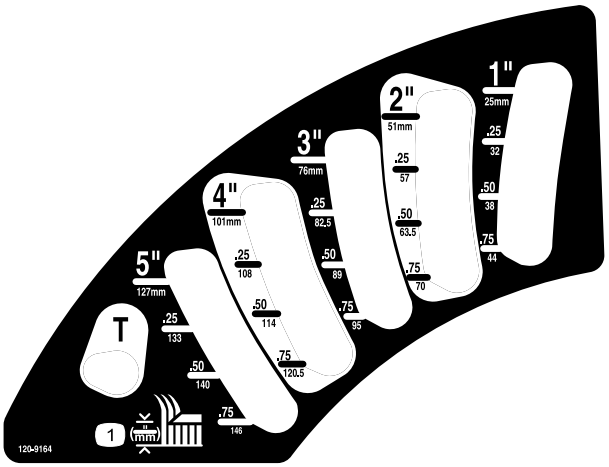
117–2718



decal117-3276

117-3276

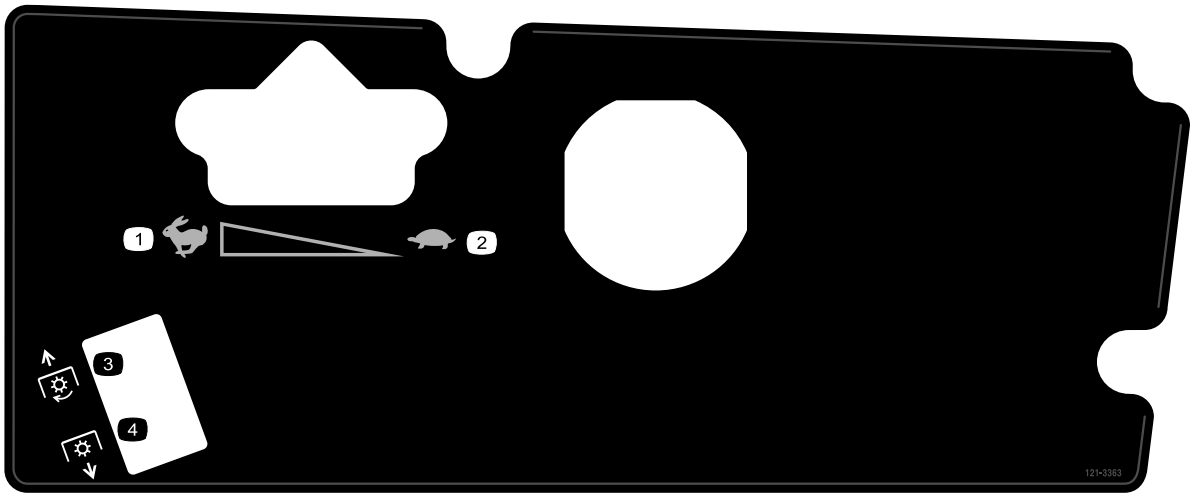
1. Engine coolant under pressure
2. Explosion hazard—read the *Operator's Manual*.
3. Warning—do not touch the hot surface.
4. Warning—read the *Operator's Manual*.



decal120-9164

120–9164

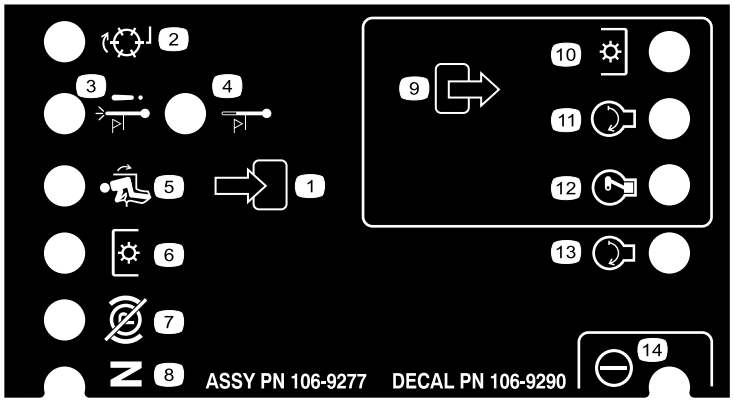
1. Height-of-cut settings



decal121-3363

121–3363

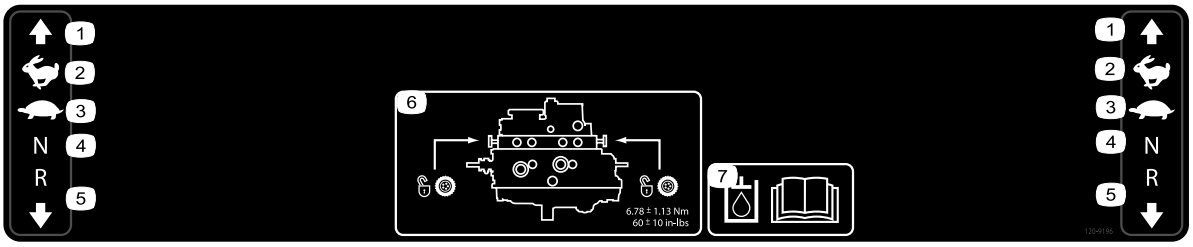
1. Fast
2. Slow
3. Engage PTO
4. Disengage PTO



decal106-9290

106-9290

1. Inputs
2. Not active
3. High temperature shutdown
4. High temperature warning
5. In seat
6. Power Take-off (PTO)
7. Parking brake Off
8. Neutral
9. Outputs
10. Power Take Off (PTO)
11. Start
12. Energize to Run (ETR)
13. Start
14. Power



decal120-9196

120-9196

1. Forward
2. Fast
3. Slow
4. Neutral
5. Reverse
6. Tow valve location; torque the tow valves to 5.65 to 7.91 N·m (50 to 70 in-lb).
7. Read the *Operator's Manual* for more information on the hydraulic fluid.

Setup

Loose Parts

Use the chart below to verify that all parts have been shipped.

Procedure	Description	Qty.	Use
1	No parts required	–	Raise the roll bar.
2	Mower deck Installation Instructions	1	Install the mower deck.
3	No parts required	–	Adjust the left, front caster wheel.
4	No parts required	–	Check the tire pressure.
5	No parts required	–	Check the hydraulic fluid, engine oil, and coolant levels.
6	Operator's Manual Engine owner's manual Parts Catalog Operator training material Engine warranty Declaration of Conformity Deck Installation Instructions	1 1 1 1 1 1 1	Read the manuals and view the training materials before operating the machine. Use the remaining parts for the installation of attachments.

1

Raising the Roll Bar

No Parts Required

Procedure

Raise the roll bar; refer to Raising the ROPS (page 19).

2

Installing the Mower Deck

Parts needed for this procedure:

1	Mower deck *Installation Instructions*

Procedure

Install the mower deck using the *Installation Instructions* for that mower deck.

3

Adjusting the Left, Front Caster Wheel

No Parts Required

Procedure

Adjust the left, front caster wheel to the outside position for 72-inch mower decks and to the inside position for 60-inch and 62-inch mower decks.

4

Checking the Tire Pressure

No Parts Required

Procedure

The tires are overinflated for shipping. Release some air to reduce the pressure. The correct air pressure is 103 kPa (15 psi) in the rear tires and 172 kPa (25 psi) in the caster wheels.

5

Checking the Fluid Levels

No Parts Required

Procedure

1. Check the hydraulic fluid level before starting the engine; refer to Hydraulic System Maintenance (page 60).
2. Check the engine oil level before and after starting the engine; refer to Checking the Engine-Oil Level (page 46).
3. Check the cooling system before starting the engine; refer to Checking the Cooling System (page 52).

6

Reading the Manuals and Viewing the Training Materials

Parts needed for this procedure:

1	*Operator's Manual*
1	Engine owner's manual
1	*Parts Catalog*
1	Operator training material
1	Engine warranty
1	*Declaration of Conformity*
1	Deck *Installation Instructions*

Procedure

1. Read the manuals.
2. View the operator training materials.

Product Overview

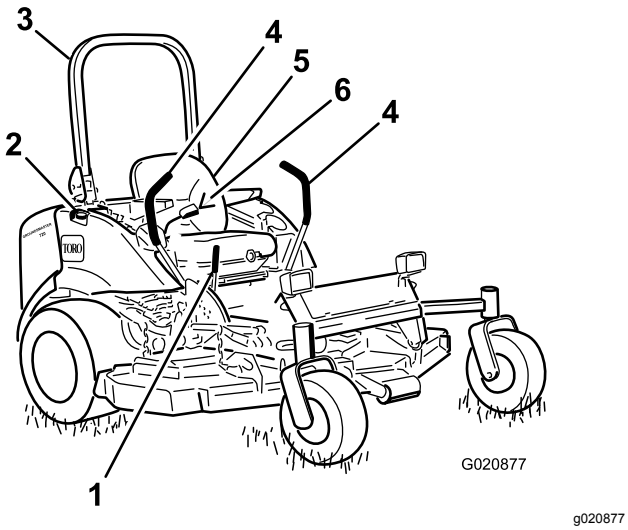


Figure 4

1. Parking brake lever
2. Fuel cap (both sides)
3. Roll bar
4. Motion control lever
5. Seat
6. Seat belt

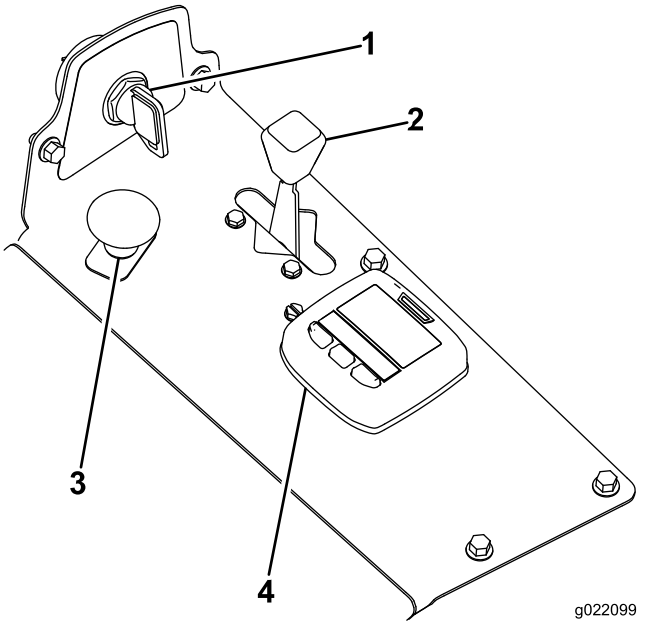


Figure 5

1. Ignition switch
2. Throttle lever
3. Power take off (PTO) Switch
4. InfoCenter

Controls

Become familiar with all the controls before you start the engine and operate the machine (Figure 4 and Figure 5).

Motion-Control Levers

The motion-control levers control the forward and rearward motions as well as the turning of the machine. Refer to Driving the Machine (page 25).

Parking-Brake Lever

Whenever you shut off the engine, engage the parking brake to prevent accidental movement of the machine. To engage the parking brake, pull the parking-brake lever rearward and up (Figure 6). To release the parking brake, push the parking-brake lever forward and down.

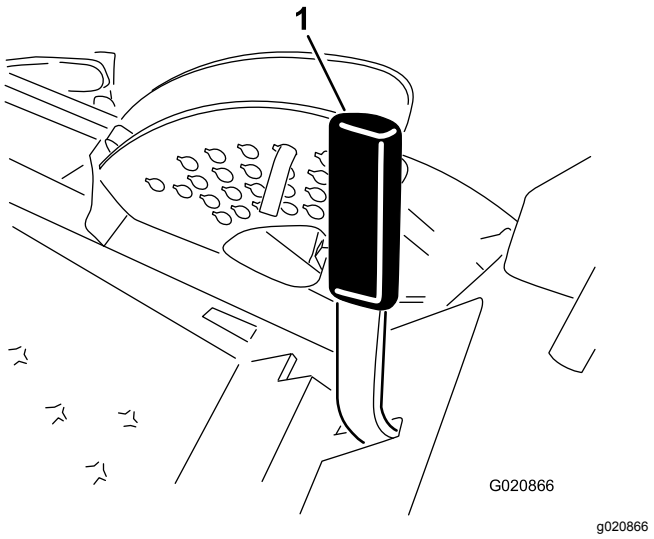


Figure 6

1. Parking-brake lever

Ignition Switch

The ignition switch has 3 positions: OFF, ON/PREHEAT, and START.

Throttle Lever

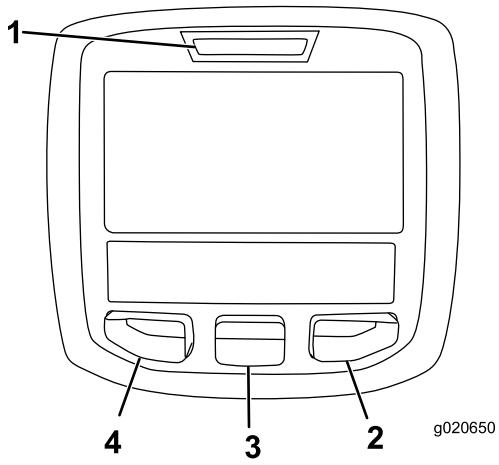
The throttle lever controls the speed of the engine, the speed of the blades, and, in conjunction with motion-control levers, the ground speed of the machine. Moving the throttle lever forward toward the FAST position increases the engine speed. Moving it rearward toward the SLOW position decreases the engine speed. Always run the machine with the throttle in the FAST position when cutting grass.

Power-Takeoff (PTO) Switch

The power-takeoff (PTO) switch starts and stops the mower blades.

Using the InfoCenter LCD Display

The InfoCenter LCD display shows information about your machine such as the operating status, various diagnostics and other information about the machine (Figure 7). There is a splash screen and main information screen of the InfoCenter. You can switch between the splash screen and main information screen, at any time, by pressing any of the InfoCenter buttons and then selecting the appropriate directional arrow.



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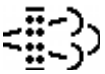
Figure 7

1. Indicator light
2. Right button
3. Middle button
4. Left button

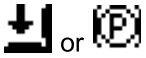
- Left Button, Menu Access/Back Button—press this button to access the InfoCenter menus. You can use it to back out of any menu you are currently using.
- Middle Button—use this button to scroll down menus.
- Right Button—use this button to open a menu where a right arrow indicates additional content.

Note: The purpose of each button may change depending on what is required at the time. Each button is labeled with an icon displaying its current function.

InfoCenter Icon Description

SERVICE DUE	Indicates when scheduled service should be performed
RPM	Engine RPM/status—indicates the engine RPM
	Hour meter
	Info icon
	Stationary regeneration required
	Glow plugs are active
	Operator must sit in seat
	Parking Brake Indicator—indicates when the parking brake is on
	Coolant Temperature-indicates the engine coolant temperature in either °C or °F
	Temperature (hot)
	Denied or not allowed
	Engine start
	Stop or shutdown
	Engine
	Key switch
PIN	PIN code
CAN	CAN bus
	InfoCenter
Bad	Bad or failed
	Bulb
HI	High: over allowed range
LO	Low: under allowed range
HI / LO	Out of range
	Switch

InfoCenter Icon Description (cont'd.)

	Operator must release switch
	Operator should change to indicated state
Symbols are often combined to form sentences. Some examples are shown below	
	Engine start denied
	Engine shutdown
	Engine coolant too hot
 or	Sit down or set parking brake

Using the Menus

To access the InfoCenter menu system, press the menu access button while at the main screen. This brings you to the main menu. Refer to the following tables for a synopsis of the options available from the menus:

Main Menu	
Menu Item	**Description**
Faults	The Faults menu contains a list of the recent machine faults. Refer to the Service Manual or your Authorized Toro Distributor for more information on the Faults menu and the information contained there.
Service	The Service menu contains information on the machine such as hours of use and other similar numbers.
Settings	The Settings menu allows you to customize and modify configuration variables on the InfoCenter display.
About	The About menu lists the model number, serial number, and software version of your machine.

Service	
Menu Item	**Description**
Hours	Lists the total number of hours that the machine, engine and fan have been on, as well as the number of hours the machine has been transported and has overheated.

Settings	
Menu Item	**Description**
Units	Controls the units used on the InfoCenter. The menu choices are English or Metric
Language	Controls the language used on the InfoCenter*.
LCD Backlight	Controls the brightness of the LCD display.
LCD Contrast	Controls the contrast of the LCD display.
Protected Menus	Allows a person authorized by your company with the PIN code to access protected menus.

* Only "operator-faced" text is translated. Faults, Service, and Diagnostics screens are "service-faced." Titles will be in the selected language, but menu items are in English.

About	
Menu Item	**Description**
Model	Lists the model number of the machine.
SN	Lists the serial number of the machine.
Machine Controller Revision	Lists the software revision of the master controller.
InfoCenter Revision	Lists the software revision of the InfoCenter.
CAN Bus	Lists the machine communication bus status.

Protected Menus

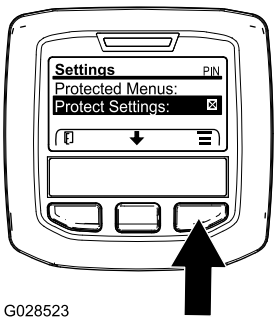
There is 1 operating function that is accessed within the Service Menu of the InfoCenter: Regeneration request; refer to Diesel Particulate Filter Regeneration (page 28). This function is in the Protected Menu.

Accessing Protected Menus

Note: The factory default PIN code for you machine is either 0000 or 1234.

If you changed the PIN code and forgot the code, contact your Authorized Toro Distributor for assistance.

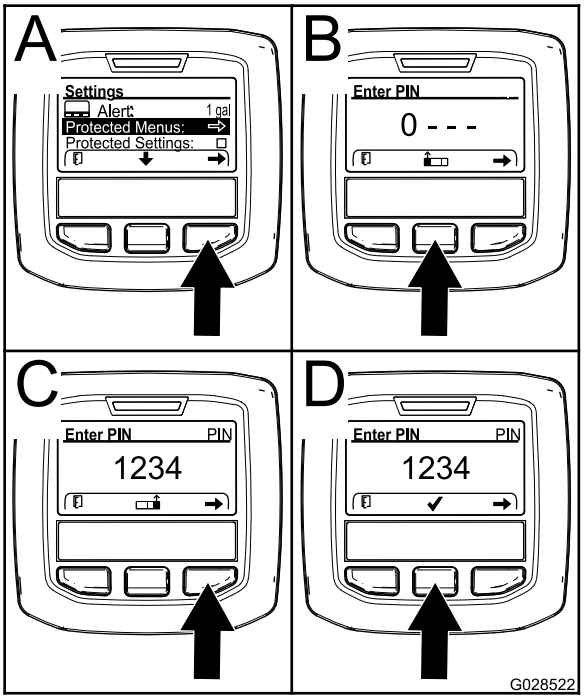
1. From the MAIN MENU, use the center button to scroll down to the SETTINGS MENU and press the right button (Figure 8).



g028523

Figure 8

2. In the SETTINGS MENU, use the center button to scroll down to the PROTECTED MENU and press the right button (Figure 9A).



g028522

Figure 9

3. To enter the PIN code, press the center button until the correct first digit appears, then press the right button to move on to the next digit (Figure 9B and Figure 9C). Repeat this step until the last digit is entered and press the right button once more.
4. Press the middle button to enter the PIN code (Figure 9D).

   Wait until the red indicator light of the InfoCenter illuminates.

   Note: If the InfoCenter accepts the PIN code and the protected menu is unlocked, the word “PIN” displays in the upper right corner of the screen.

Note: Rotate the key switch to the OFF position and then to the ON position locks the protected menu.

You have the ability to view and change the settings in the Protected Menu. Once you access the Protected Menu, scroll down to Protect Settings option. Use the right button to change the setting. Setting the Protect Settings to OFF allows you to view and change the settings in the Protected Menu without entering the PIN code. Setting the Protect Settings to ON hides the protected options and requires you to enter the PIN code to change the setting in the Protected Menu. After you set the PIN code, rotate the key switch OFF and back to the ON position to enable and save this feature.

Specifications

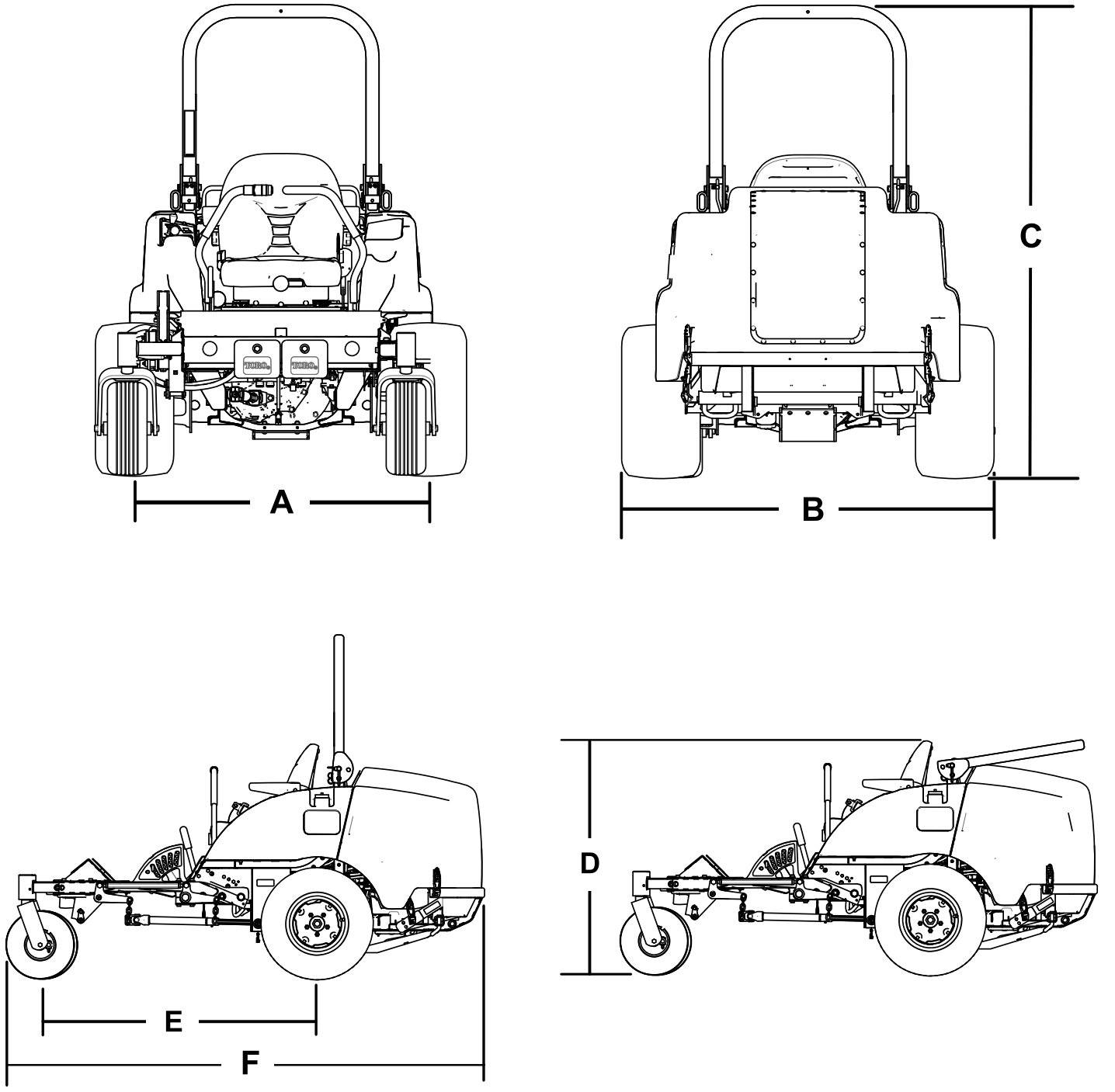


Figure 10

Description	Figure 10 reference	Dimension or Weight
Height with roll bar up	C	183 cm (72 inches)
Height with roll bar down	D	125 cm (49 inches)
Overall length	F	253 cm (99-1/2 inches)
Overall width	B	145 cm (57 inches)
Wheel base	E	145 cm (57-1/4 inches)
Wheel tread (tire center to center) rear	A	114 cm (45 inches)

Ground clearance			10 cm (4 inches)
Weight, with 72 inch Side-Discharge Mower (30354 or 30481)			1052 kg (2,320 lb)
Weight, with 60 inch Side-Discharge Mower (30456)			1036 kg (2,284 lb)
Weight, with 72 inch Base Mower Deck (30353)			1012 kg (2,231 lb)
Weight, with 62 inch Base Mower Deck (30457)			990 kg (2,183 lb)
Weight with the 100in Rear-Discharge Mower (31101)			1200 kg (2,646 lb)

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

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 Distributor or go to www.Toro.com for a list of all approved attachments and accessories.

Operation

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

Before Operation

Before Operation Safety

General Safety

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

Fuel Safety

- Use extreme care in handling fuel. It is flammable and its vapors are explosive.
- Extinguish all cigarettes, cigars, pipes, and other sources of ignition.
- Use only an approved fuel container.
- Never remove the fuel cap or fill the fuel tank while the engine is running or hot.
- Never refuel the machine in an enclosed space.

- Never store the machine or fuel container where there is an open flame, spark, or pilot light, such as on a water heater or other appliance.
- If you spill fuel, do not attempt to start the engine; avoid creating any source of ignition until the fuel vapors have dissipated.

Adding Fuel

Fuel Specification

Important: **Use only ultra-low sulphur diesel fuel. Fuel with higher rates of sulfur degrades the diesel oxidation catalyst (DOC), which causes operational problems and shortens the service life of engine components.**

Failure to observe the following cautions may damage the engine.

- Never use kerosene or gasoline instead of diesel fuel.
- Never mix kerosene or used engine oil with the diesel fuel.
- Never keep fuel in containers with zinc plating on the inside.
- Do not use fuel additives.

Petroleum Diesel

Cetane rating: 45 or higher

Sulfur content: Ultra-low sulfur (<15 ppm)

Fuel Table

Diesel fuel specification	Location
ASTM D975 No. 1-D S15 No. 2-D S15	USA
EN 590	European Union
ISO 8217 DMX	International
JIS K2204 Grade No. 2	Japan
KSM-2610	Korea

- Use only clean, fresh diesel fuel or biodiesel fuels.
- Purchase fuel in quantities that can be used within 180 days to ensure fuel freshness.

Use summer-grade diesel fuel (No. 2-D) at temperatures above -7°C (20°F) and winter-grade fuel (No. 1-D or No. 1-D/2-D blend) below that temperature.

Note: Use of winter-grade fuel at lower temperatures provides lower flash point and cold flow characteristics which eases starting and reduces fuel filter plugging.

Using summer-grade fuel above -7°C (20°F) contributes toward longer fuel pump life and increased power compared to winter-grade fuel.

Biodiesel

This machine can also use a biodiesel blended fuel of up to B20 (20% biodiesel, 80% petroleum diesel).

Sulfur content: Ultra-low sulfur (<15 ppm)

Biodiesel fuel specification: ASTM D6751 or EN14214

Blended fuel specification: ASTM D975, EN590, or JIS K2204

Important: **The petroleum diesel portion must be ultra-low sulfur.**

Observe the following precautions:

- Biodiesel blends may damage painted surfaces.
- Use B5 (biodiesel content of 5%) or lesser blends in cold weather.
- Monitor seals, hoses, gaskets in contact with fuel as they may be degraded over time.
- Fuel filter plugging may be expected for a time after converting to biodiesel blends.
- Contact your Authorized Toro Distributor if you wish for more information on biodiesel.

Fuel Tank Capacity

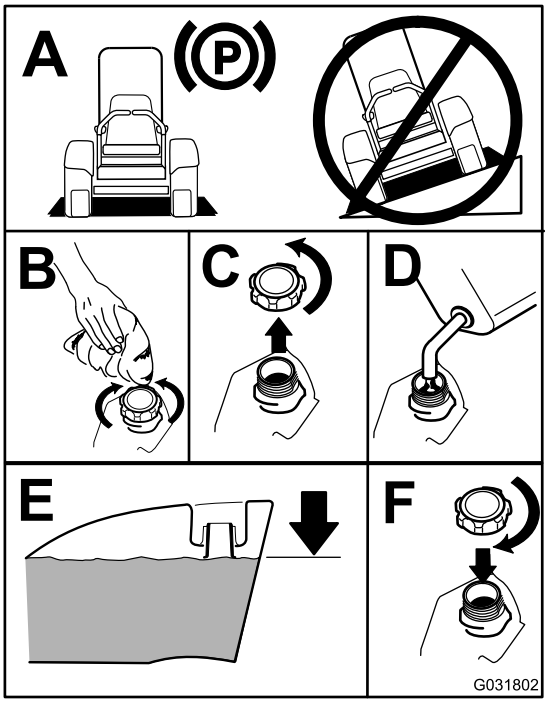
43.5 L (11.5 US gallons)

Filling the Fuel Tank

Important: **The fuel tanks are connected, but the fuel does not transfer quickly from one tank to the other. It is important when filling that you park on a level surface. If you park on a hill, you may inadvertently overfill the tanks.**

Important: **Do not overfill the fuel tanks.**

Important: **Do not open the fuel tanks when parked on a hill. The fuel could spill out.**



g031802

Figure 11

Note: If possible, fill the fuel tanks after each use. This minimizes buildup of condensation inside the fuel tank.

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.

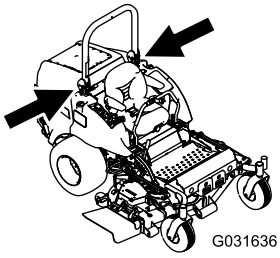
⚠ WARNING

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

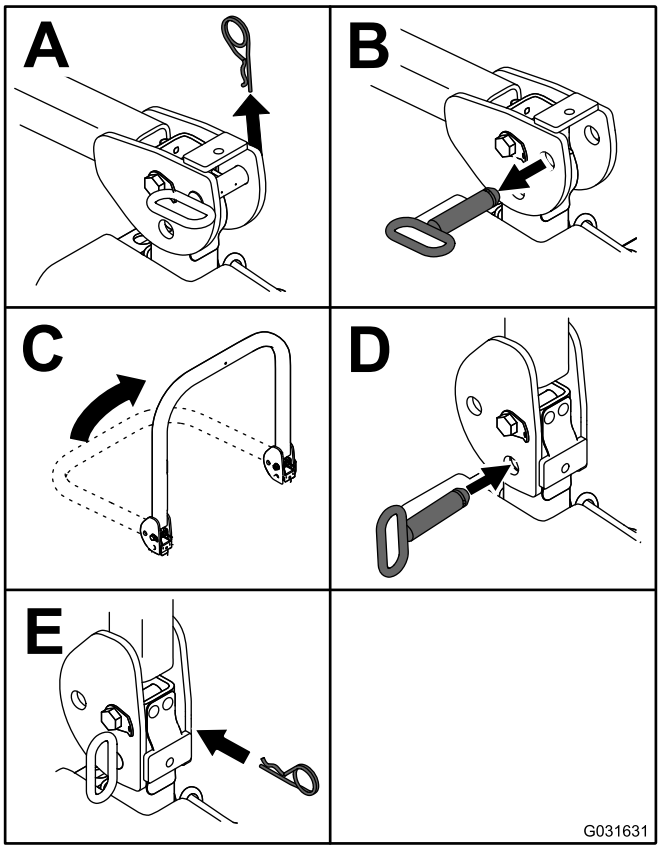
- **Lower the roll bar only when absolutely necessary.**
- **Do not wear the seat belt when the roll bar is in the down position.**
- **Drive slowly and carefully.**
- **Raise the roll bar as soon as clearance permits.**
- **Check carefully for overhead clearances (i.e. branches, doorways, electrical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

Raising the ROPS

Raise the ROPS as shown in Figure 13.



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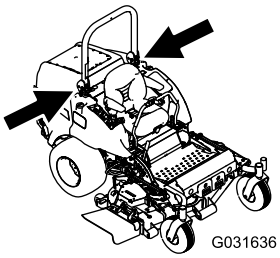
Figure 12

Important: **Always use the seat belt when the roll bar is in the raised and locked position. Do not use the seat belt when the roll bar is in the lowered position.**

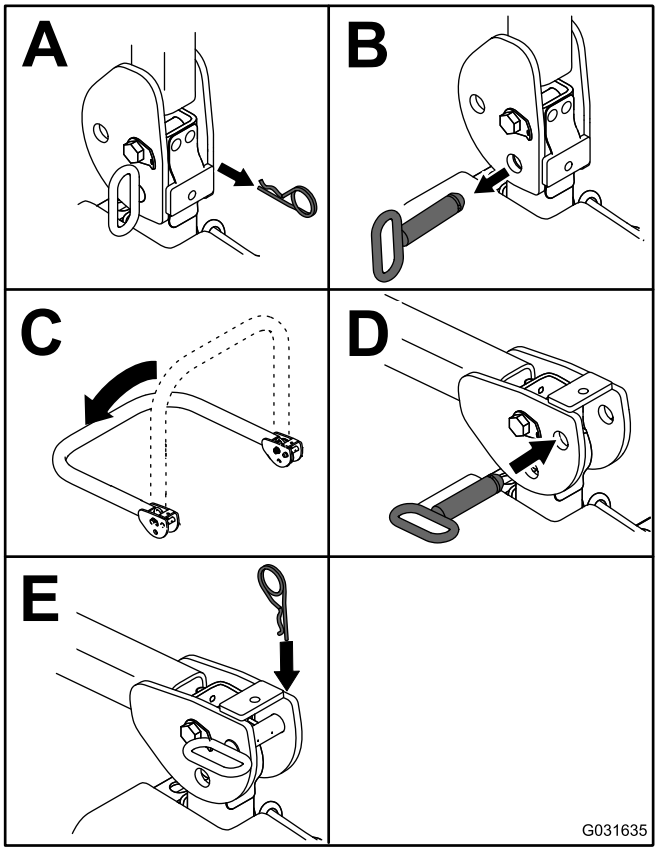
Lowering the ROPS

Lower the ROPS as shown in Figure 12.

Note: Push the bar forward to relieve pressure on the pins.



g031636



g031635

Figure 13

Note: Secure the ROPS so that it does not damage the hood.

Think Safety First

Please read all safety instructions and symbols in the safety section. Knowing this information could help you or bystanders avoid injury.

⚠ DANGER

Operating the machine on wet grass or steep slopes can cause sliding and loss of control.

- **Reduce speed and use extreme caution on slopes.**
- **Do not operate the machine near water.**

⚠ DANGER

Wheels dropping over edges can cause rollovers, which may result in serious injury, death, or drowning.

Do not operate the machine near drop-offs.

⚠ DANGER

Operating the machine while the roll bar is down may lead to serious injury or death in the event of a rollover.

Always keep the roll bar in the fully raised and locked position and use the seat belt.

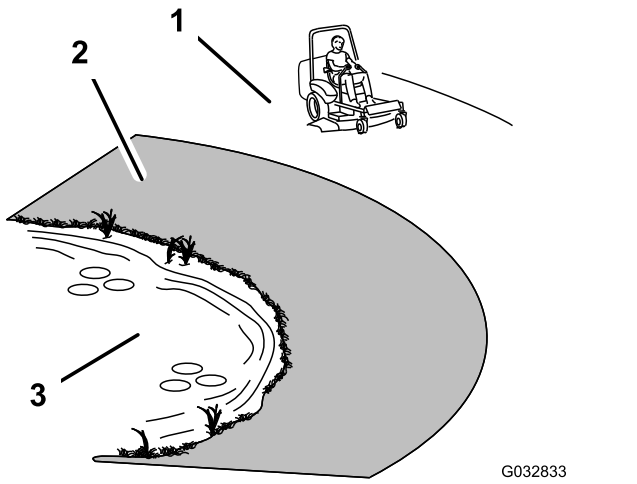


Figure 14

1. Safe zone
2. Use a walk-behind mower and/or hand trimmer near drop-offs and water.
3. Water

⚠ CAUTION

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

Wear hearing protection when operating this machine.

Use protective equipment for your eyes, ears, hands, feet, and head.

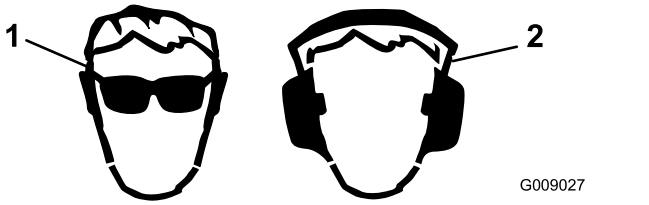


Figure 15

1. Wear eye protection.
2. Wear hearing protection.

Using the Safety-Interlock System

⚠ CAUTION

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 prevents the engine from starting unless:

- You are sitting on the seat or the parking brake is engaged.
- The power takeoff (PTO) is disengaged.
- The motion-control levers are in the NEUTRAL-LOCK position.
- The engine temperature is below the maximum operating temperature.

The safety-interlock system also shuts off the engine when you move the traction controls from the NEUTRAL-LOCK position with the parking brake engaged. If you rise from the seat when the PTO

is engaged, there is a 1-second delay and then the engine shuts off.

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 PTO to the ON position. Try starting the engine; the engine should not crank.
2. Sit on the seat, engage the parking brake, and move the PTO to the OFF position. Move either motion-control lever out of the NEUTRAL-LOCK position. Try starting the engine; the engine should not crank. Repeat for other motion-control lever.
3. Sit on the seat, engage the parking brake, move the PTO switch to the OFF position, and move the motion-control levers to the NEUTRAL-LOCK position. Start the engine. While the engine is running, release the parking brake, engage the PTO, and rise slightly from the seat; the engine should shut off within 2 seconds.
4. Without an operator on the seat, engage the parking brake, move the PTO switch to the OFF position, and move the motion-control levers to the NEUTRAL-LOCK position. Start the engine. While the engine is running, center either motion control; the engine should shut off within 2 seconds. Repeat for the other motion-control lever.
5. Without an operator on the seat, disengage the parking brake, move the PTO switch to the OFF position, and move the motion-control levers to the NEUTRAL-LOCK position. Try starting the engine; the engine should not crank.

Using the SCM to Diagnose System Problems

The machine is equipped with a standard control module (SCM) monitoring system that tracks the function of various key systems. The SCM is located under the right control panel. Access it through the side panel cover (Figure 16). To open the side panel cover, release the 2 latches and pull out on it.

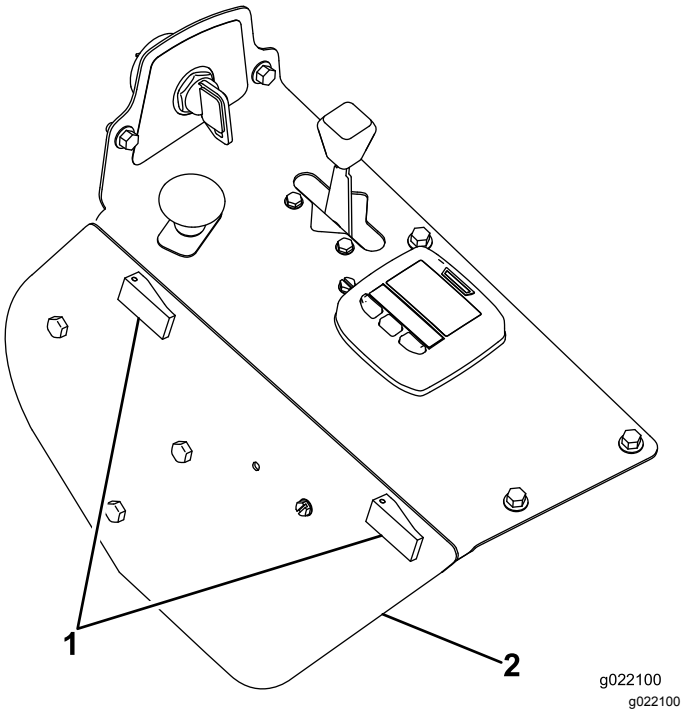


Figure 16

1. Side panel cover
2. Latches

On the face of the SCM are 11 LEDs that illuminate to indicate various system conditions. You can use 7 of these lights for system diagnosis. Refer to Figure 17 for a description of what each light means. For details on using the rest of the SCM functions, refer to the *Service Manual*, available through your Authorized Toro Distributor.

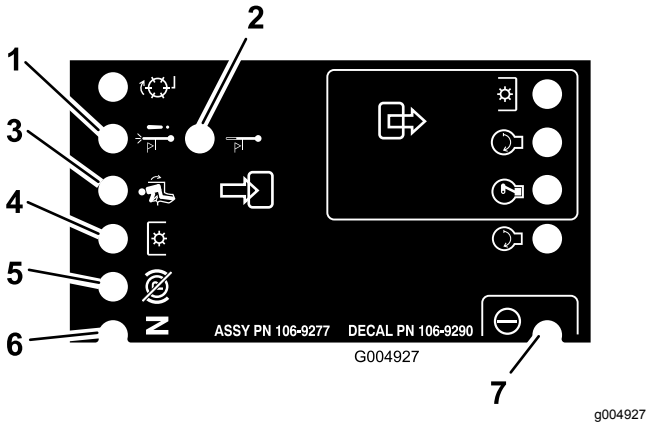


Figure 17

1. High temperature shutdown—the engine temperature has exceeded safe levels and the engine has been shut down. Check the cooling system.
2. High temperature warning—the engine temperature is approaching unsafe levels and the mower deck has been shut down. Check the cooling system.
3. Operator is in the seat.
4. The PTO is on.
5. The parking brake is not engaged.
6. Controls are in neutral.
7. The SCM is receiving power and is operational.

Positioning the Seat

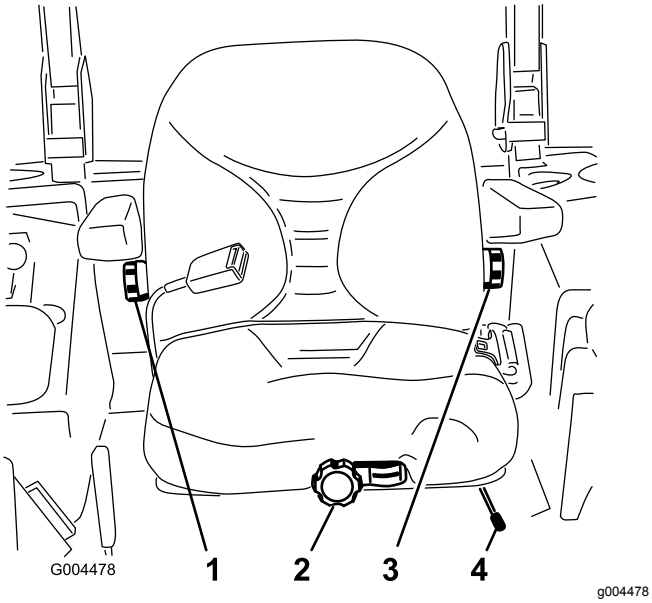


Figure 18

1. Back-rest knob
2. Seat-suspension knob
3. Lumbar-support-adjustment knob
4. Seat-position-adjustment lever

Changing the Seat Position

You can move the seat forward and backward. Position the seat where you have the best control of the machine and are most comfortable.

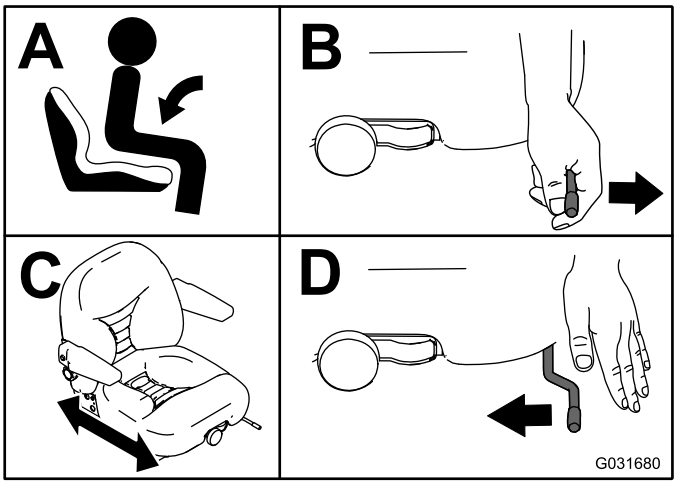


Figure 19

Changing the Seat Suspension

You can adjust the seat for a smooth and comfortable ride. Position the seat where you are most comfortable.

Without sitting on the seat, turn the knob in front either direction (Figure 18).

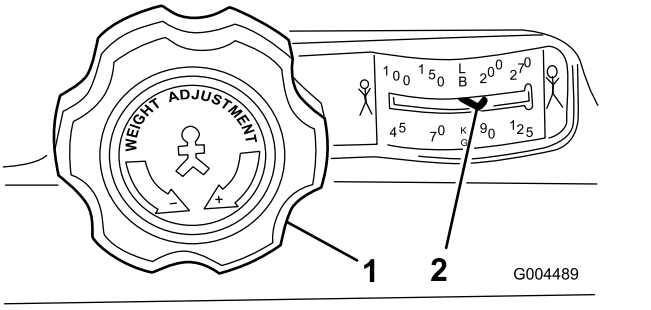


Figure 20

1. Seat-suspension knob
2. Operator-weight setting

Changing the Back Position

You can adjust the back of the seat for a comfortable ride. Position the back of the seat where you are most comfortable.

To adjust it, turn the knob, under the right arm rest, in either direction (Figure 18).

Changing the Lumbar Support

You can adjust the lumbar support for your lower back.

To adjust it, turn the knob, under the left arm rest, in either direction (Figure 18).

Unlatching the Seat

To access the hydraulic and other systems under the seat, unlatch the seat and swing it forward.

1. Use the seat position adjustment lever to slide the seat all the way forward.
2. Pull the seat latch forward and lift up to unlatch the seat (Figure 21).

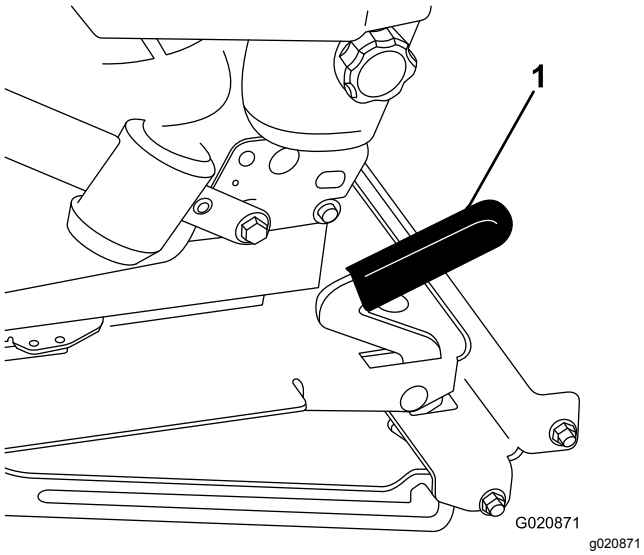


Figure 21

1. Seat latch

During Operation

During Operation Safety

General Safety

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

Rollover Protection System (ROPS) Safety

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

Machines with a Foldable Roll Bar

- Always use the seat belt with the roll bar in the raised position.
- The ROPS is an integral safety device. Keep a folding roll bar in the raised and locked position, and use the seat belt when operating the machine with the roll bar in the raised position.
- Lower a folding roll bar temporarily only when necessary. Do not wear the seat belt when the roll bar is folded down.
- Be aware that there is no rollover protection when a folded roll bar is in the down position.
- Check the area that you will be mowing and never fold down a folding roll bar in areas where there are slopes, drop-offs, or water.

Slope Safety

- Slow down the machine and use extra care on hillsides. Travel up and down on hillsides. Turf conditions can affect the stability of the machine.
- Avoid turning the machine on slopes. If you must turn the machine, turn it slowly and gradually downhill, if possible.
- Do not turn the machine sharply. Use care when reversing the machine.
- Use extra care while operating the machine with attachments; they can affect the stability of the machine.

Operating the Parking Brake

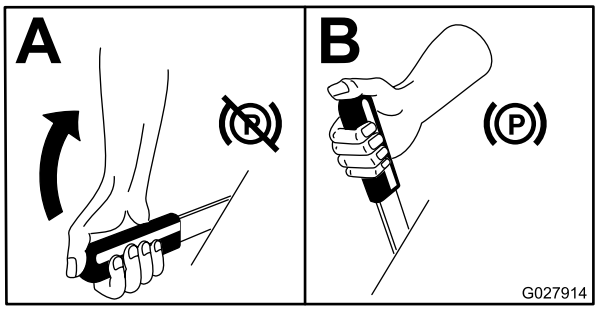
Always engage the parking brake when you stop the machine or leave it unattended.

Engaging the Parking Brake

⚠ WARNING

The parking brake may not hold the machine parked on a slope and could cause personal injury or property damage.

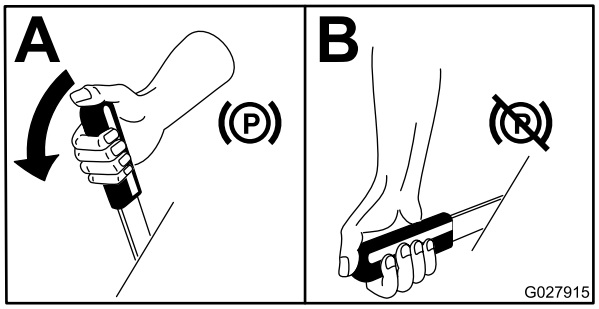
Do not park the machine on slopes unless the wheels are chocked or blocked.



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Figure 22

Releasing the Parking Brake



g027915

Figure 23

Starting and Shutting Off the Engine

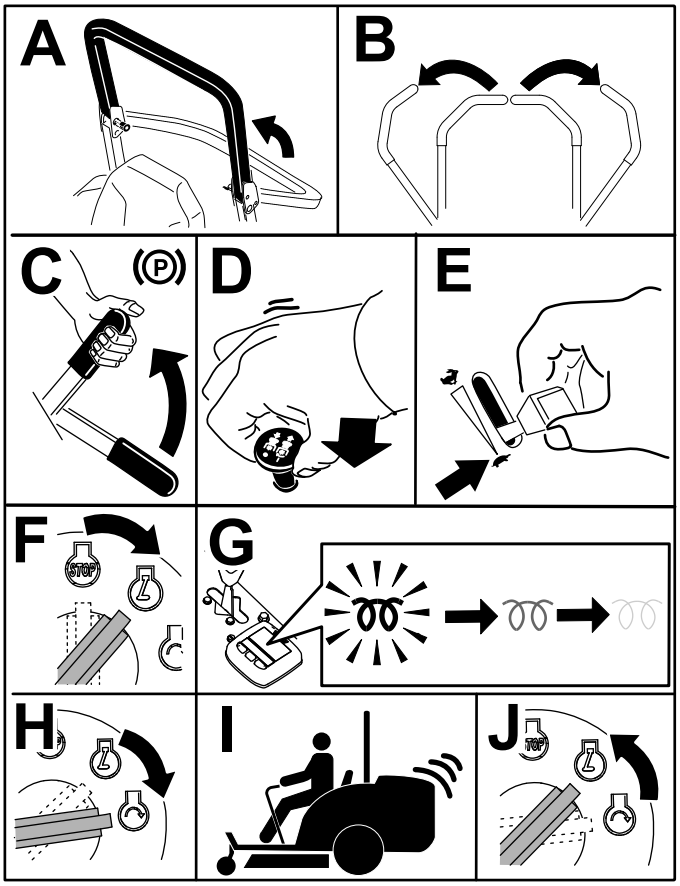
Starting the Engine

Note: The glow plug light illuminates for 6 seconds when you turn the ignition key to the RUN position. Turn the ignition to the START position after the light goes out.

Important: **Use starting cycles of no more than 15 seconds per minute to avoid overheating the starter motor.**

Important: **Operate the machine with the throttle lever in the SLOW position in both the forward and reverse directions for 1 to 2 minutes after changing the engine oil, overhauling either the engine, transmission, or wheel motor, and when**

you start the engine for the first time. Operate the lift lever and PTO lever to ensure that they operate properly. Shut the engine off, check fluid levels, and check for oil leaks, loose parts, and any other noticeable malfunctions.



g191793

Figure 24

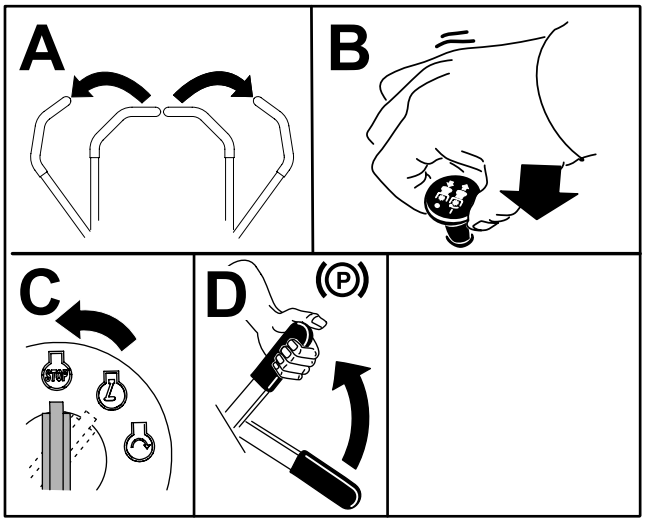
Note: Leave the throttle midway between the SLOW and FAST positions until the engine and hydraulic system warm up.

Shutting Off the Engine

⚠ CAUTION

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

Always remove the ignition key and engage the parking brake when leaving the machine unattended, even if just for a few minutes.



g191795

Figure 25

Driving the Machine

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 FAST throttle position when running powered attachments.

⚠ CAUTION

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

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

1. Release the parking brake.

   Note: The engine shuts off if you move the motion-control levers out of the NEUTRAL-LOCK position with the parking brake engaged.
2. Move the levers to the center, unlocked position.
3. Drive the machine as follows:
   - To move straight forward, slowly push the motion-control levers forward (Figure 26).
   - To move straight rearward, slowly pull the motion-control levers rearward (Figure 26).
   - To turn, slow the machine by pulling back on both levers and then push forward on the lever on the opposite side from which you want to turn (Figure 26).
   - To stop, pull the motion-control levers to the NEUTRAL position.

Note: The farther you move the motion-control levers in either direction, the faster the machine moves in that direction.

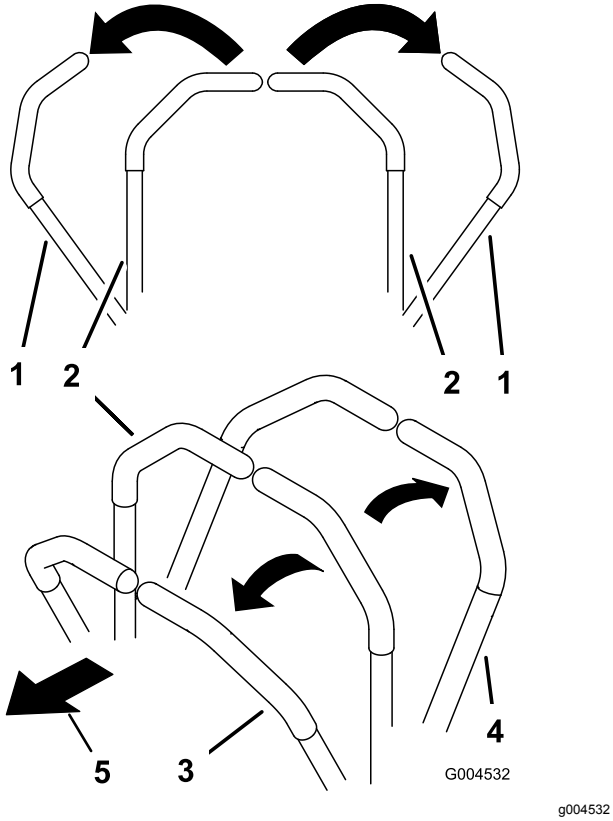


Figure 26

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

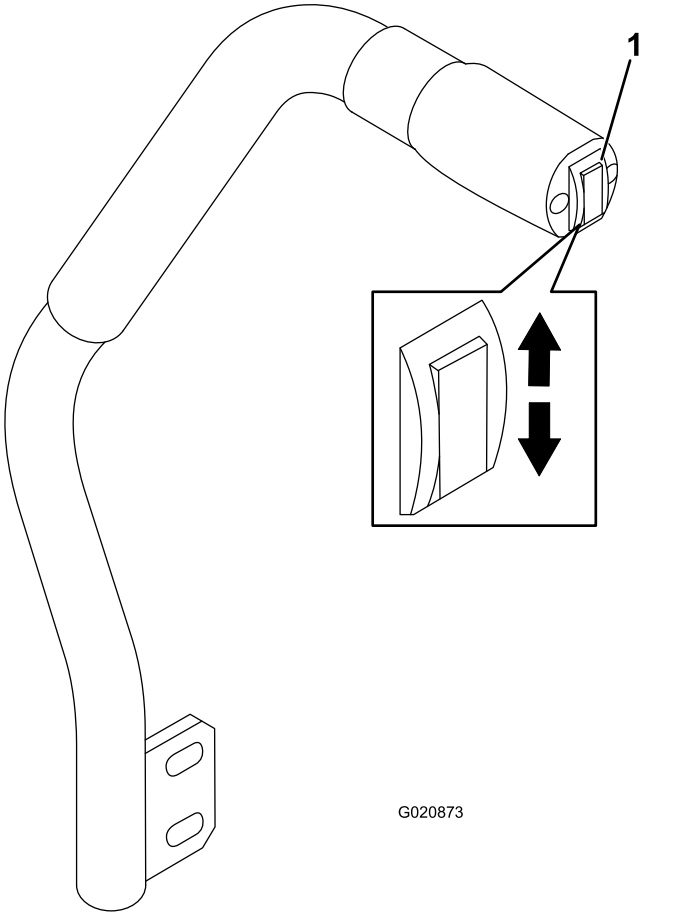


Figure 27

1. Deck-lift switch

Operating the Mower

Using the Deck-Lift Switch

The deck-lift switch raises and lowers the mower deck (Figure 27). The engine must be running for you to use this lever.

- To lower the mower deck, push the deck-lift switch down (Figure 27).

  Important: **When you lower the mower deck, it sets in a float/idle position.**

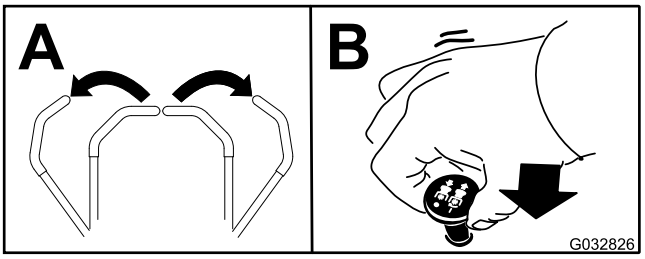
- To raise the mover deck, push the deck-lift switch up (Figure 27).

Important: **Do not continue to hold the switch up or down after the mower has fully raised or lowered. Doing so damages the hydraulic system.**

Engaging the Power Takeoff (PTO)

The power-takeoff (PTO) switch starts and stops the mower blades and some powered attachments.

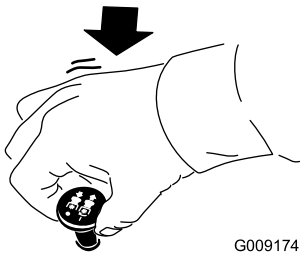
Note: If the engine is cold, allow the engine to warm up 5 to 10 minutes before engaging the PTO.



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Figure 28

Disengaging the PTO



g009174

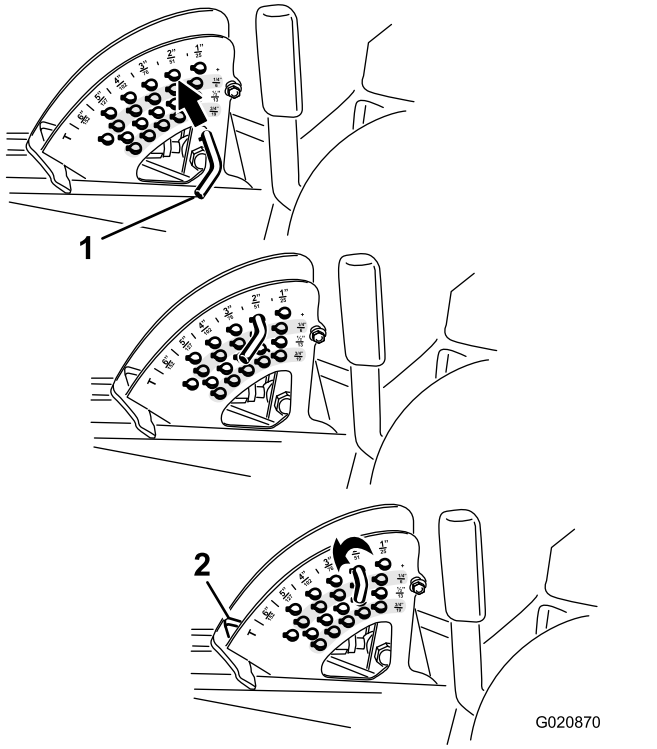
Figure 29

Adjusting the Height of Cut

You can adjust the height of cut from 2.5 to 15.8 cm (1 to 6 inches) in 6 mm (1/4 inch) increments by relocating the stop pin into different hole locations.

1. With the engine running, push the deck-lift switch up until the mower deck is fully raised and **release the switch immediately** (Figure 27).
2. Rotate the stop pin until the roll pin in it lines up with the slots in the holes in the height-of-cut bracket and remove it (Figure 30).
3. Select a hole in the height-of-cut bracket corresponding to the height of cut desired, insert the pin, and rotate it down to lock it in place (Figure 30).

   Note: There are 4 rows of hole positions (Figure 30). The top row gives you the height of cut listed above the pin. The second row down gives you the height listed plus 6 mm (1/4 inch). The third row down gives you the height listed plus 12 mm (1/2 inch). The bottom row gives you the height listed plus 18 mm (3/4 inch). For the 15.8 cm (6 inch) position, there is only 1 hole, located in the second row. This does not add 6 mm (1/4 inch) to the 15.8 cm (6 inch) position.



g020870

Figure 30

1. Stop pin
2. Height-of-cut stop

4. Adjust the anti-scalp rollers and skids as required.

Cutting Grass with the Machine

Note: Cutting grass at a rate that loads the engine promotes DPF regeneration.

1. Move the machine to the job site.
2. Whenever possible, set the engine-speed switch to high idle.
3. Engage the PTO switch.
4. Gradually move the motion-control levers forward and slowly drive the machine over the mowing area.
5. Once the front of the cutting units are over the mowing area, lower the cutting units.
6. Cut grass so that the blades can cut and discharge clippings at a high rate while producing a good quality of cut.

   Note: If the cutting rate is too high, the quality of cut may deteriorate. Reduce the ground speed of the machine or reduce the width of cut to regain high idle engine speed.
7. When the cutting units are over the far edge of the mowing area, lift the cutting units.
8. Perform a tear-shaped turn to quickly line up for your next pass.

Diesel Particulate Filter Regeneration

The diesel particulate filter (DPF) is part of the exhaust system. The diesel-oxidation catalyst of the DPF reduces harmful gasses and the soot filter removes soot from the engine exhaust.

The DPF regeneration process uses heat from the engine exhaust to incinerate the soot accumulated on the soot filter, converting the soot to ash, and clears the channels of the soot filter so that filtered engine exhaust flows out the DPF.

The engine computer monitors the accumulation of soot by measuring the back pressure in the DPF. If the back pressure is too high, soot is not incinerating in the soot filter through normal engine operation. To keep the DPF clear of soot, remember the following:

- Passive regeneration occurs continuously while the engine is running—run the engine at full engine speed when possible to promote DPF regeneration.
- If the back pressure is too high, the engine computer signals you through the InfoCenter when additional processes (assist and reset regeneration) are running.
- Allow the assist and reset regeneration process to complete before shutting off the engine.

Operate and maintain your machine with the function of the DPF in mind. Engine load at high idle engine speed generally produce adequate exhaust temperature for DPF regeneration.

Important: **Minimize the amount of time that you idle the engine or operate the engine at low-engine speed to help reduce the accumulation of soot in the soot filter.**

⚠ CAUTION

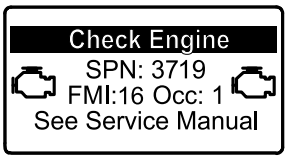
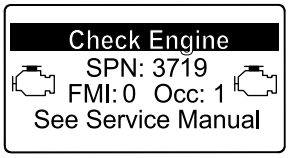
The exhaust temperature is hot (approximately 600°C (1112°F) during DPF parked regeneration or recovery regeneration. Hot exhaust gas can harm you or other people.

- **Never operate the engine in an enclosed area.**
- **Make sure that there are no flammable materials around the exhaust system.**
- **Never touch a hot exhaust system component.**
- **Never stand near or around the exhaust pipe of the machine.**

DPF Soot Accumulation

- Over time, the DPF accumulates soot in the soot filter. The computer for the engine monitors the soot level in the DPF.
- When enough soot accumulates, the computer informs you that it is time to regenerate the diesel particulate filter.
- DPF regeneration is a process that heats the DPF to convert the soot to ash.
- In addition to the warning messages, the computer reduces the power produced by the engine at different soot-accumulation levels.

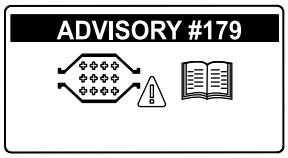
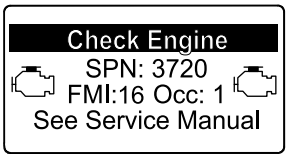
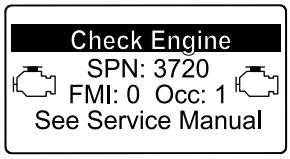
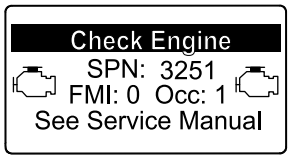
Engine Warning Messages—Soot Accumulation

Indication Level	Fault Code	Engine Power Rating	Recommended Action
Level 1: Engine Warning	 g213866 **Figure 31** Check Engine SPN 3719, FMI 16	The computer de-rates the engine power to 85%	Perform a parked regeneration as soon as possible; refer to Parked Regeneration (page 33).
Level 2: Engine Warning	 g213867 **Figure 32** Check Engine SPN 3719, FMI 0	The computer de-rates the engine power to 50%	Perform a recovery regeneration as soon as possible; refer to Recovery Regeneration (page 36).

DPF Ash Accumulation

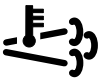
- The lighter ash is discharged through the exhaust system; the heavier ash collects in the soot filter.
- Ash is a residue of the regeneration process. Over time, the diesel particulate filter accumulates ash that does not discharge with the engine exhaust.
- The computer for the engine calculates the amount of ash accumulated in the DPF.
- When enough ash accumulates, the engine computer sends information to the InfoCenter in the form of a system advisory or an engine fault to indicate the accumulation of ash in the DPF.
- The advisory and faults are indications that it is time to service the DPF.
- In addition to the warnings, the computer reduces the power produced by the engine at different ash-accumulation levels.

InfoCenter Advisory and Engine Warning Messages—Ash Accumulation

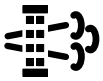
Indication Level	Advisory or Fault Code	Engine Speed Reduction	Engine Power Rating	Recommended Action
Level 1: System Advisory	 g213865 **Figure 33** Advisory #179	None	100%	Notify your service department that advisory #179 displays in the InfoCenter.
Level 2: Engine Warning	 g213863 **Figure 34** Check Engine SPN 3720, FMI 16	None	The computer de-rates the engine power to 85%	Service the DPF; refer to Servicing the Diesel-Oxidation Catalyst (DOC) and the Soot Filter (page 47)
Level 3: Engine Warning	 g213864 **Figure 35** Check Engine SPN 3720, FMI 0	None	The computer de-rates the engine power to 50%	Service the DPF; refer to Servicing the Diesel-Oxidation Catalyst (DOC) and the Soot Filter (page 47)
Level 4: Engine Warning	 g214715 **Figure 36** Check Engine SPN 3251, FMI 0	Engine speed at max torque + 200 rpm	The computer de-rates the engine power to 50%	Service the DPF; refer to Servicing the Diesel-Oxidation Catalyst (DOC) and the Soot Filter (page 47)

Types of Diesel Particulate Filter Regeneration

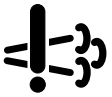
Types of diesel particulate filter regeneration that are performed while the machine is operating:

Type of Regeneration	Conditions for DPF regeneration	DPF description of operation
Passive	Occurs during normal operation of the machine at high-engine speed or high-engine load	The InfoCenter does not display an icon indicating passive regeneration. During passive regeneration, the DPF processes high-heat exhaust gasses; oxidizing harmful emissions and burning soot to ash. Refer to Passive DPF Regeneration (page 32).
Assist	Occurs as a result of low-engine speed, low-engine load, or after the computer detects back pressure in the DPF	 When the assist/reset-regeneration icon is displayed in the InfoCenter, an assist regeneration is in progress. During assist regeneration, the computer controls the intake throttle to increase the exhaust temperature, enabling assist regeneration to occur. Refer to Assist DPF Regeneration (page 32).
Reset	Occurs after assist regeneration only if the computer detects that assist regeneration did not sufficiently reduce the soot level Also occurs every 100 hours to reset baseline sensor readings	 When the assist/reset-regeneration icon is displayed in the InfoCenter, a regeneration is in progress. During reset regeneration, the computer controls the intake throttle and fuel injectors to increase the exhaust temperature during regeneration. Refer to Reset Regeneration (page 33).

Types of diesel particulate filter regeneration that require you to park the machine:

Type of Regeneration	Conditions for DPF regeneration	DPF description of operation
Parked	Soot buildup occurs as a result of prolonged operation at low-engine speed or low-engine load. May also occur as a result of using incorrect fuel or oil The computer detects back pressure due to soot buildup and requests a parked regeneration	 When the parked-regeneration icon is displayed in the InfoCenter, a regeneration is requested. • Perform the parked regeneration as soon as possible to avoid needing a recovery regeneration. • A parked regeneration requires 30 to 60 minutes to complete. • You must have at least a 1/4 tank of fuel in the tank. • You must park the machine to perform a recovery regeneration. Refer to Parked Regeneration (page 33).

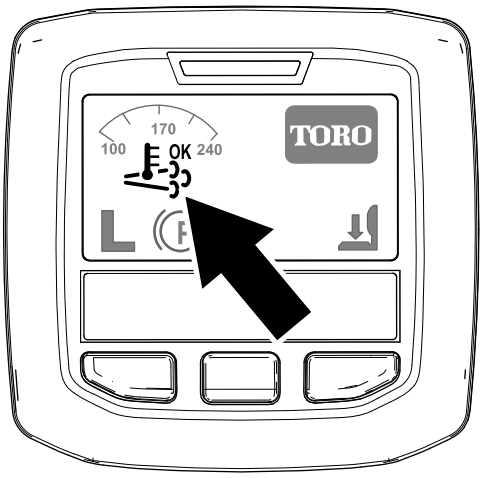
Types of diesel particulate filter regeneration that require you to park the machine: (cont'd.)

Type of Regeneration	Conditions for DPF regeneration	DPF description of operation
Recovery	Occurs as a result of ignoring parked regeneration requests and continuing operation, adding more soot when the DPF is already in need of a parked regeneration	When the recovery-regeneration icon  is displayed in the InfoCenter, a recovery regeneration is requested. Contact your Authorized Toro Distributor to have a service technician perform the recovery regeneration. • A recovery regeneration requires up to 4 hours to complete. • You must have at least a 1/2 tank of fuel in the machine. • You must park the machine to perform a recovery regeneration. Refer to Recovery Regeneration (page 36).

Passive DPF Regeneration

- Passive regeneration occurs as part of normal engine operation.
- While operating the machine, run the engine at full-engine speed when possible to promote DPF regeneration.

Assist DPF Regeneration



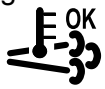
g214711

Figure 37
Assist/reset-regeneration icon

- The assist/reset-regeneration icon displays in the InfoCenter (Figure 37).
- The computer takes control of the intake throttle to increase the temperature of the engine exhaust.
- While operating the machine, run the engine at full engine speed when possible to promote DPF regeneration.
- The 

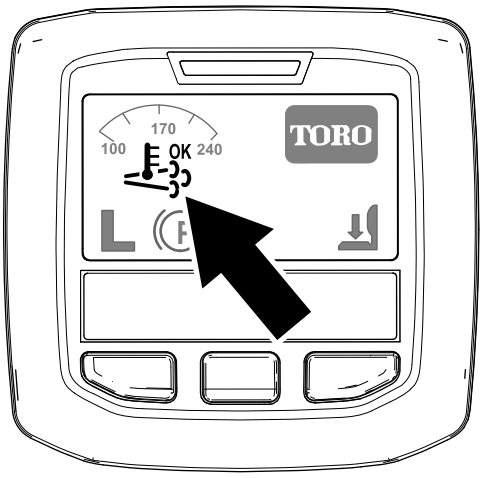
icon displays in the InfoCenter while the assist regeneration is processing.
- Whenever possible, do not shut off the engine or reduce engine speed while the assist regeneration is processing.

Important: **Allow the machine to complete the assist regeneration process before shutting off the engine.**

Note: The assist regeneration is finished processing when the 

icon disappears from the InfoCenter.

Reset Regeneration



g214711

Figure 38
Assist/reset-regeneration icon

- The assist/reset-regeneration icon displays in the InfoCenter (Figure 38).
- The computer takes control of the intake throttle and changes the fuel injection operation to increase the temperature of the engine exhaust.

  Important: **The assist/reset-regeneration icon indicates that the exhaust temperature discharged from of your machine may be hotter than during regular operation.**
- While operating the machine, run the engine at full engine speed when possible to promote DPF regeneration.
- The 

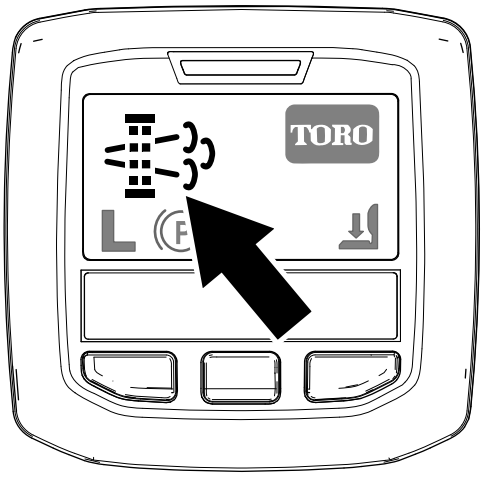
icon displays in the InfoCenter while the reset regeneration is processing.
- Whenever possible, do not shut off the engine or reduce engine speed while the reset regeneration is processing.

  Important: **Allow the machine to complete the reset regeneration process before shutting off the engine.**

  Note: The reset regeneration is finished processing when the 

icon disappears from the InfoCenter.

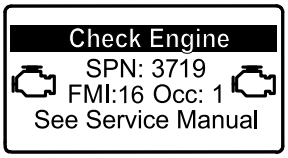
Parked Regeneration



g214713

Figure 39
Parked-regeneration request icon

- The parked-regeneration requested icon displays in the InfoCenter (Figure 39).
- If a parked regeneration is needed, the InfoCenter displays engine warning SPN 3719, FMI 16 (Figure 40) and the engine computer derates engine power to 85%.



g213866

Figure 40

Important: **If you do not complete a parked regeneration within 2 hours, the engine computer derates engine power to 50%.**

- A parked regeneration requires 30 to 60 minutes to complete.
- If you are authorized by your company, you need the PIN code to perform the parked-regeneration process.

Preparing to Perform a Parked or Recovery Regeneration

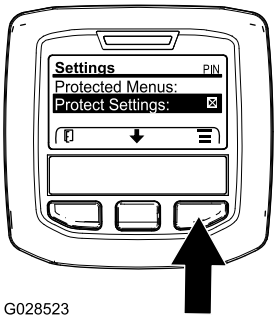
1. Ensure that the machine has at least 1/4 tank of fuel.
2. Move the machine outside to an area away from combustible materials.
3. Park the machine on a level surface.
4. Ensure that the traction control or motion-control levers are in the NEUTRAL position.
5. If applicable, lower the cutting units and shut them off.

6. Engage the parking brake.
7. Set the throttle to the low IDLE position.

Performing a Parked Regeneration

Note: For instructions on unlocking protected menus, refer to Accessing Protected Menus (page 14).

1. Access the protected menu and unlock the protected settings submenu (Figure 41); refer to Accessing Protected Menus (page 14).

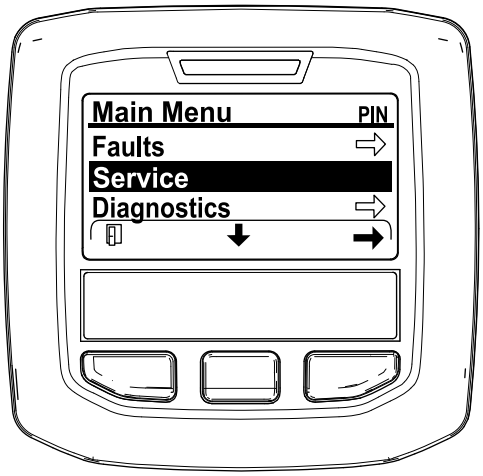


g028523

Figure 41

2. Navigate to the MAIN MENU, press the center button to scroll down to the SERVICE MENU, and press the right button to select the SERVICE option (Figure 42).

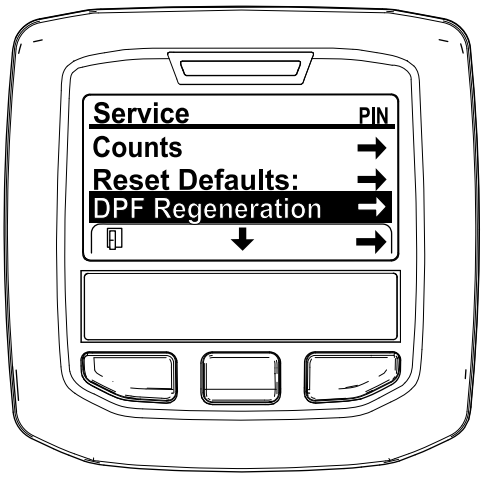
   Note: The InfoCenter should display the PIN indicator in the upper right corner of the display.



g212371

Figure 42

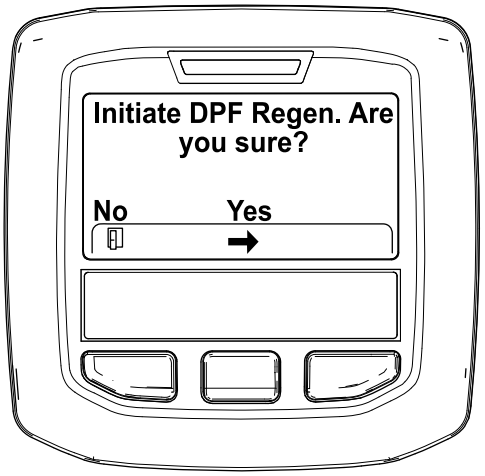
3. In the SERVICE MENU, press the middle button until the DPF REGENERATION options displays, and press the right button to select the DPF REGENERATION option (Figure 43).



g212138

Figure 43

4. When the “Initiate DPF Regen. Are you sure?” message displays, press the center button (Figure 44).



g212125

Figure 44

5. If the coolant temperature is below 60°C (140°F) the “Insure is running and above 60C/140F” message displays. (Figure 45).

   Observe the temperature in the display, and run the machine at full throttle until the temperature reaches 60°C (140°F), then press the center button.

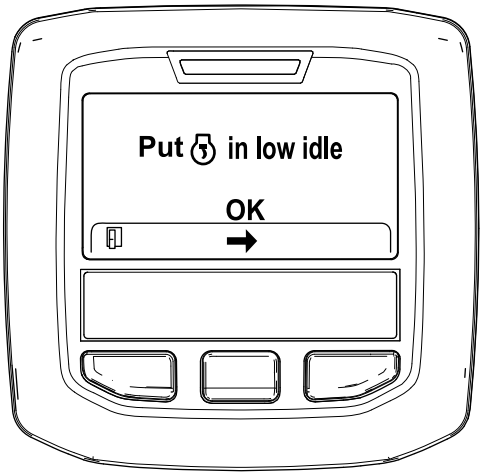
   Note: If the coolant temperature is above 60°C (140°F) this screen is skipped.



g211986

Figure 45

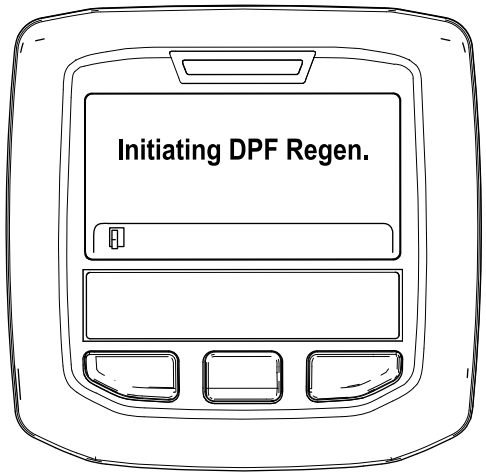
6. Move the throttle control to LOW IDLE and press the center button (Figure 46).



g212372

Figure 46

7. The following messages display as the parked regeneration process begins:
   A. The “Initiating DPF Regen.” message displays (Figure 47).



g212405

Figure 47

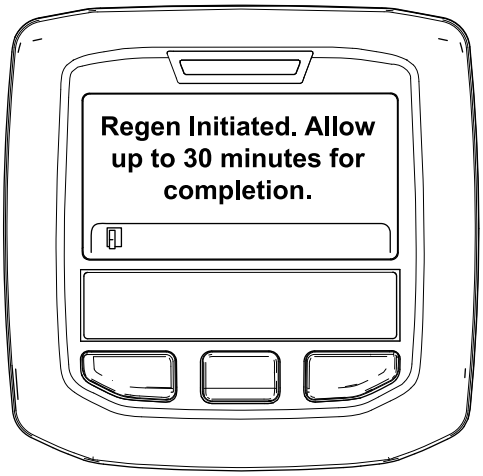
   B. The “Waiting on ” message displays (Figure 48).



g212406

Figure 48

   C. The computer determines whether the regeneration runs. One of the following messages displays in the InfoCenter:
      - If the regeneration is allowed, the “Regen Initiated. Allow up to 30 minutes for completion” message displays in the InfoCenter, wait for the machine to complete the parked regeneration process (Figure 49).

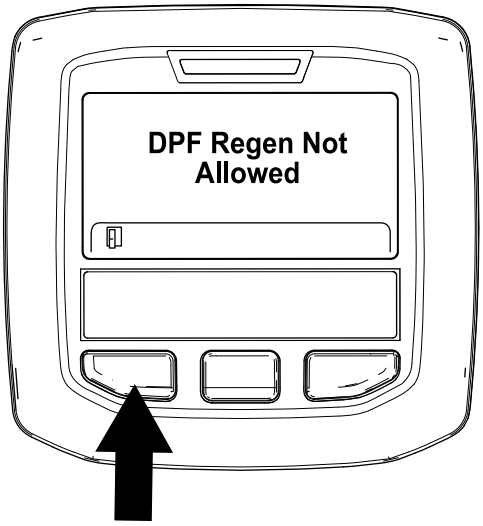


g213424

Figure 49

- If the regeneration process is not allowed by the engine computer, the “DPF Regen Not Allowed” message displays in the InfoCenter (Figure 50). Press the left button to exit to the home screen

  Important: **If you did not meet all the requirements for regeneration or if less than 50 hours have passed since the last regeneration, the “DPF Regen Not Allowed” message appears.**



g212410

Figure 50

8. While the regeneration is running, the InfoCenter returns to the home screen and shows the following icons:



The engine is cold—wait.

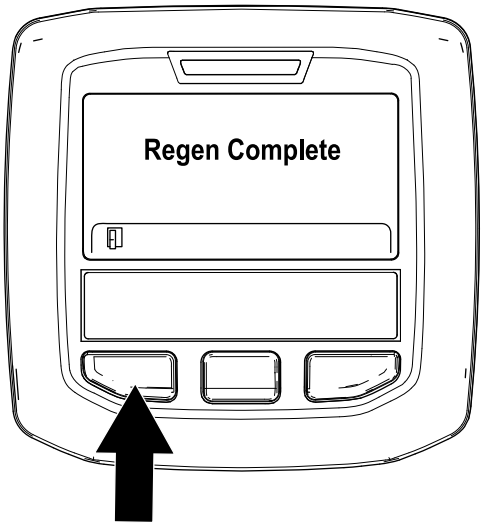


The engine is warm—wait.



The engine hot—regeneration in progress (percent complete).

9. The parked regeneration is complete when the “Regen Complete” message displays in the InfoCenter. Press the left button to exit to the home screen (Figure 51).

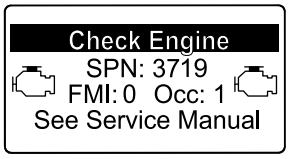


g212404

Figure 51

Recovery Regeneration

- If you ignore the request for a parked regeneration (displayed in the InfoCenter) and continue to operate the machine, a critical amount of soot builds up in the DPF.
- If a recovery regeneration is needed, the InfoCenter displays engine warning SPN 3719, FMI 16 (Figure 52) and the engine computer derates engine power to 85%.



g213867

Figure 52

Important: **If you do not complete a recovery regeneration within 15 minutes, the engine computer derates engine power to 50%.**

- Perform a recovery-regeneration whenever there is a loss of engine power and a parked regeneration cannot effectively clean the DPF of soot.
- A recovery regeneration requires up to 4 hours to complete.
- You need a distributor technician to perform the recovery regeneration process; contact your Authorized Toro Distributor.

Operating Tips

Fast Throttle Setting/Ground Speed

To maintain enough power for the machine and deck while mowing, operate the engine at the FAST throttle position and adjust your ground speed for conditions. Decrease the ground speed as the load on the cutting blades increase; increase the ground speed as the load on the blades decrease.

Mowing Direction

Alternate mowing direction to avoid making ruts in the turf over time. This also helps disperse clippings, which enhances decomposition and fertilization.

Cutting Speed

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

Avoid Cutting Too Low

If the cutting width of the mower is wider than the mower you previously used, raise the cutting height to ensure that uneven turf is not cut too short.

Select the Proper Height-of-Cut Setting

Remove approximately 25 mm (1 inch) or no more than 1/3 of the grass blade when cutting. In exceptionally lush and dense grass, you may have to slow down the forward speed and/or raise the height of cut to the next higher setting.

Important: **If you are cutting more than 1/3 of the grass blade off or mowing in sparse long grass or dry conditions, then use flat sail blades to reduce airborne chaff, debris, and deck-drive component strain.**

Cutting Long Grass

If the grass ever grows slightly longer than normal, or if it contains a high degree of moisture, raise the cutting height higher than usual and cut the grass at this setting. Then cut the grass again using the lower, normal setting.

Keeping the Mower Clean

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

To reduce the risk of fire hazard, keep the engine, muffler, battery compartment, parking brake, cutting units, and fuel storage compartment free of grass, leaves, or excessive grease. Clean up any spilled oil or fuel.

Maintaining the Blade

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 blades daily for sharpness and for any wear or damage. 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

- Clean grass and debris from the cutting units, mufflers, and engine compartment to help prevent fires. Clean up oil or fuel spills.
- If the cutting units are in the transport position, use the positive mechanical lock (if available) before you leave the machine unattended.
- Allow the engine to cool before storing the machine in any enclosure.
- Shut off the fuel before storing or transporting the machine.
- Never store the machine or fuel container where there is an open flame, spark, or pilot light, such as on a water heater or on other appliances.
- Keep all parts of the machine in good working condition and all hardware tightened, especially blade-attachment hardware.
- Replace all worn or damaged decals.

Pushing the Machine by Hand

Important: **Never tow the machine because hydraulic damage may occur.**

Pushing the Machine

1. Disengage the power takeoff (PTO) and turn the ignition key to off. Move the levers to the NEUTRAL-LOCK position and apply the parking brake. Remove the key.
2. Lift the seat.
3. Rotate each bypass valve counterclockwise 1 turn (Figure 53).

   Note: This allows hydraulic fluid to bypass the pump enabling the wheels to turn.

   Important: **Do not rotate the bypass valves more than 1 turn. This prevents valves from coming out of the body and causing fluid to run out.**

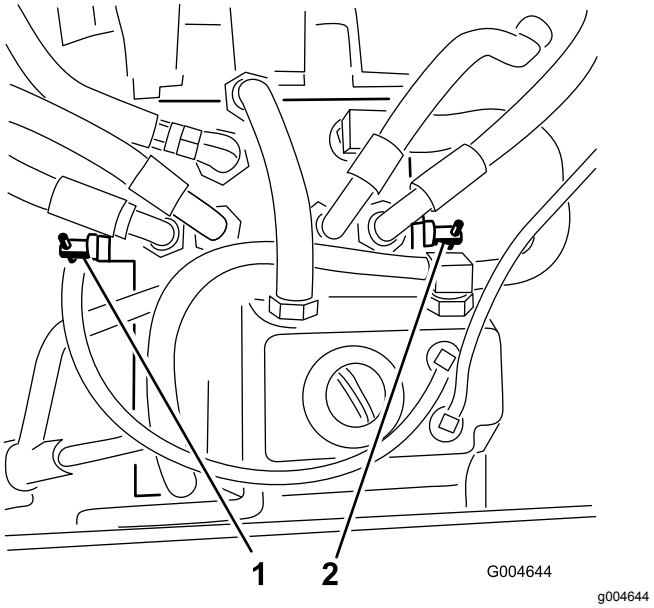


Figure 53

1. Right bypass valve
2. Left bypass valve

4. Disengage the parking brake before pushing.

Changing to Machine Operation

Rotate each bypass valve clockwise 1 turn and hand-tighten them (Figure 53).

Note: The torque should be approximately 8 N·m (71 in-lb). Do not overtighten the bypass valves.

You cannot drive the machine unless the bypass valves are turned inward.

Transporting the Machine

Use a heavy-duty trailer or truck to transport the machine. 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, your family, pets, or bystanders avoid injury.

⚠ 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.

1. If you are using a trailer, connect it to the towing vehicle, and connect the safety chains.
2. If applicable, connect the trailer brakes.
3. Load the machine onto the trailer or truck.
4. Shut off the engine, remove the key, engage the parking brake, and close the fuel valve.
5. Use the tie-down loops on the machine to securely fasten it to the trailer or truck with straps, chains, cable, or ropes (Figure 54).

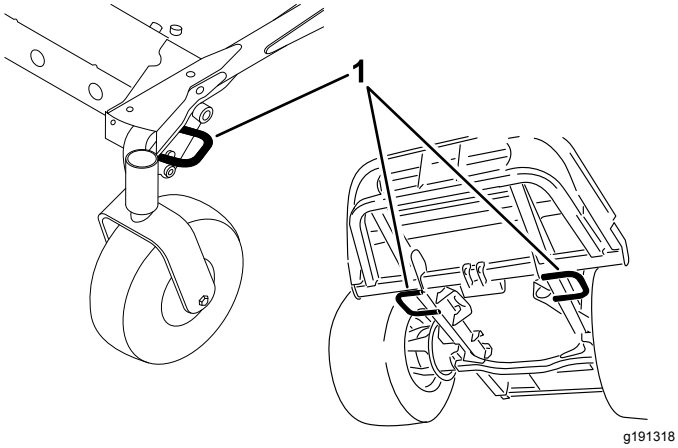


Figure 54

1. Traction unit tie-down loops

Loading the Machine

Use extreme caution when loading or unloading machines onto a trailer or a truck. Use a full-width ramp that is wider than the machine for this procedure. Back up the ramp and drive forward down the ramp (Figure 55).

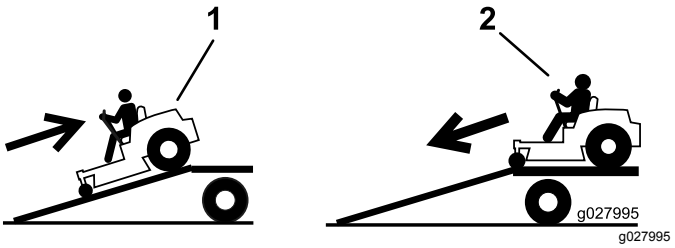


Figure 55

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

Important: **Do not use narrow individual ramps for each side of 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.**
- **Ensure that the roll bar is in the up position and use the seat belt when loading or unloading the machine. Ensure that the roll bar will clear the top of an enclosed trailer.**
- **Use only a full-width ramp; do not use individual ramps for each side of the machine.**
- **Do not exceed a 15-degree angle between the ramp and the ground or between the ramp and the trailer or truck.**
- **Ensure that the length of ramp is at least 4 times as long as the height of the trailer or truck bed to the ground. This ensures that the ramp angle does not exceed 15 degrees on flat ground.**
- **Back up ramps and drive forward down ramps.**
- **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.**

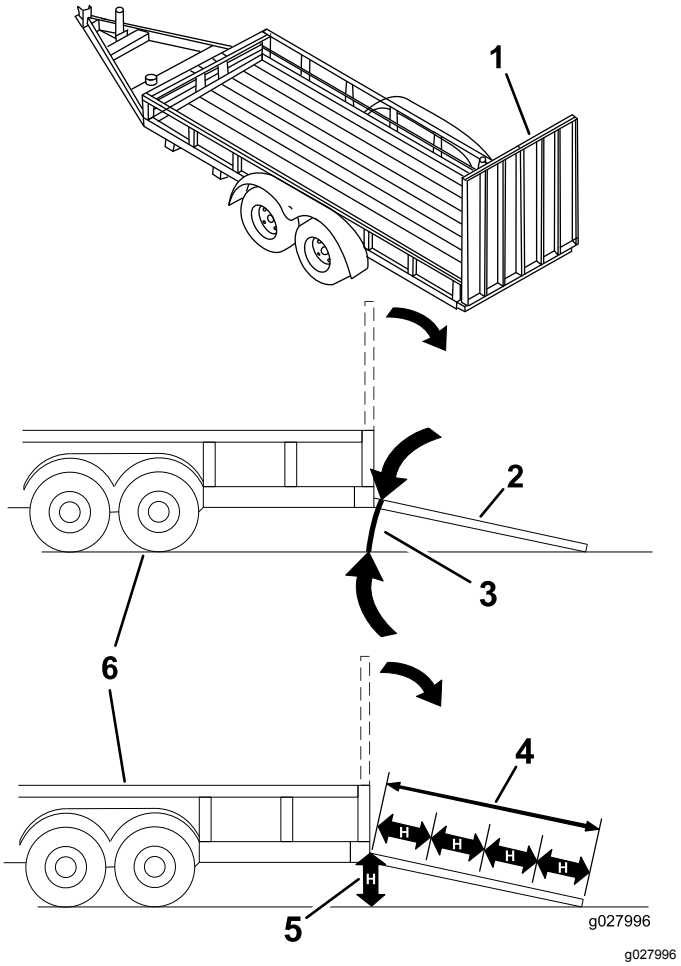


Figure 56

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

Maintenance

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

Note: Looking for an *Electrical Schematic* or *Hydraulic Schematic* for your machine? Download a free copy of the schematic by visiting www.Toro.com and searching for your machine from the Manuals link on the home page.

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first 10 hours	• Torque the frame-mounting bolts. • Torque the wheel lug nuts.
After the first 50 hours	• Change the mower-deck gearbox lubricant.
After the first 200 hours	• Change the hydraulic fluid and filter.
Before each use or daily	• Test the safety-interlock system. • Check the engine-oil level. • Check the engine coolant level. • Clean the radiator with compressed air (more often in dirty and dusty conditions). • Check the hydraulic fluid level. • Clean the mower deck.
Every 50 hours	• Grease the bearing and bushing grease fittings (more often in dirty or dusty conditions and after every washing). • Check battery cable connections. • Check the tire pressure.
Every 100 hours	• Check the alternator-belt tension.
Every 150 hours	• Check the lubricant in the mower-deck gearbox.
Every 200 hours	• Inspect the cooling-system hoses and seals. Replace them if cracked or torn. • Torque the wheel lug nuts.
Every 250 hours	• Change the engine oil and filter.
Every 400 hours	• Change the mower-deck gearbox lubricant. • Service the air cleaner (more often in dusty or sandy conditions). • Replace the engine fuel filter. • Replace the fuel-filter canister for the water separator. • Drain water or other contaminants from the water separator. • Check the fuel lines and connections.
Every 800 hours	• Change the hydraulic fluid and filter. • Inspect the engine-valve clearance. Refer to your engine owner's manual.
Every 1,500 hours	• Replace moving hoses.
Every 6,000 hours	• Disassemble, clean, and assemble the soot filter of the DPF. or clean the soot filter if engine faults SPN 3720 FMI 16, SPN 3720 FMI 0, or SPN 3720 FMI 16 display in the InfoCenter.
Every 2 years	• Drain and clean the fuel tank. • Flush and replace the cooling-system fluid.

Important: **Refer to your *Engine Operator's Manual* for additional maintenance procedures. A detailed Service Manual is also available for purchase from your Authorized Toro Distributor.**

Daily Maintenance Checklist

Duplicate this page for routine use.

Maintenance Check Item	For the week of:						
	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
Check the safety-interlock operation.							
Check the grass deflector in the down position (if applicable).							
Check the parking-brake operation.							
Check the fuel level.							
Check the hydraulic fluid level.							
Check the engine-oil level.							
Check the cooling-system fluid level.							
Check the drain water/fuel separator.							
Check the air-filter restriction indicator.[1]							
Check the radiator and screen for debris							
Check for unusual engine noises.[2]							
Check for unusual operating noises.							
Check the hydraulic hoses for damage							
Check for fluid leaks.							
Check the tire pressure.							
Check the instrument operation.							
Check the condition of the blades.							
Lubricate all grease fittings.[3]							
Touch up damaged paint.							

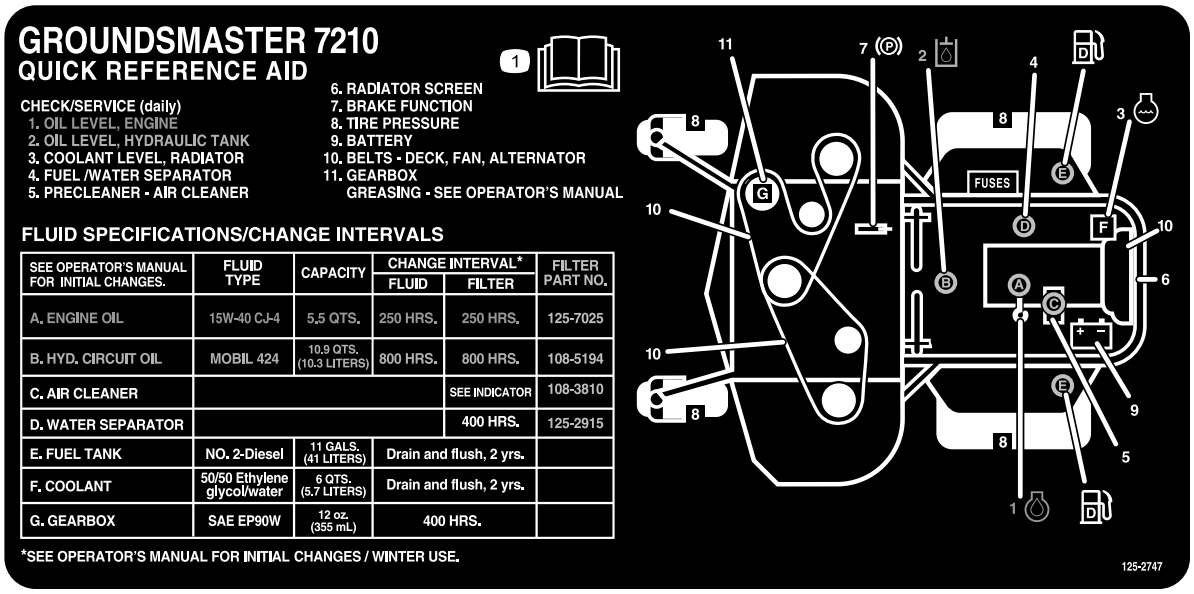
1. If the indicator shows red
2. Check glow plug and injector nozzles if you notice hard starting, excess smoke, or rough running.
3. Immediately after every washing, regardless of the interval listed.

Notation for areas of concern		
Inspection performed by:		
Item	Date	Information

⚠ CAUTION

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

Remove the key from the ignition before you do any maintenance.



SEE OPERATOR'S MANUAL FOR INITIAL CHANGES.	FLUID TYPE	CAPACITY	CHANGE INTERVAL*		FILTER PART NO.
			FLUID	FILTER	
A. ENGINE OIL	15W-40 CJ-4	5,5 QTS.	250 HRS.	250 HRS.	125-7025
B. HYD. CIRCUIT OIL	MOBIL 424	10.9 QTS. (10.3 LITERS)	800 HRS.	800 HRS.	108-5194
C. AIR CLEANER				SEE INDICATOR	108-3810
D. WATER SEPARATOR				400 HRS.	125-2915
E. FUEL TANK	NO. 2-Diesel	11 GALS. (41 LITERS)	Drain and flush, 2 yrs.		
F. COOLANT	50/50 Ethylene glycol/water	6 QTS. (5.7 LITERS)	Drain and flush, 2 yrs.		
G. GEARBOX	SAE EP90W	12 oz. (355 mL)	400 HRS.		

decal125-2747

Figure 57
Service Interval Chart

Pre-Maintenance Procedures

Important: **The fasteners on the covers of this machine are designed to remain on the cover after removal. Loosen all of the fasteners on each cover a few turns so that the cover is loose but still attached, then go back and loosen them until the cover comes free. This will prevent you from accidentally stripping the bolts free of the retainers.**

Pre-Maintenance Safety

- Before adjusting, cleaning, repairing, or leaving the machine, do the following:
  - Park the machine on a level surface.
  - Move the throttle switch to the low-idle position.
  - Disengage the cutting units.
  - Lower the cutting units.
  - Ensure that the traction is in neutral.
  - Engage the parking brake.
  - Shut off the engine and remove the key.
  - Wait for all moving parts to stop.
  - Allow machine components to cool before performing maintenance.
- If the cutting units are in the transport position, use the positive mechanical lock (if available) before you leave the machine unattended.
- If possible, do not perform maintenance while the engine is running. Keep away from moving parts.
- Use jack stands to support the machine or components when required.
- Carefully release pressure from components with stored energy.

Lubrication

Greasing the Bearings and Bushings

Service Interval: Every 50 hours (more often in dirty or dusty conditions and after every washing).

The machine has grease fittings that you must lubricate regularly with No. 2 lithium grease. Lubricate more often in dirty or dusty conditions because dirt can get into the bearings and bushings and cause accelerated wear.

1. Wipe the grease fittings clean so that foreign matter cannot be forced into the bearing or bushing.
2. Pump grease into the fittings.
3. Wipe off excess grease.

Note: Improper wash-down procedures can negatively affect bearing life. Do not wash down the machine when it is still hot and avoid directing high-pressure or high-volume spray at the bearings or seals.

Servicing the Mower-Deck Gear Box Lubricant

The gear box is designed to operate with SAE EP90W gear lube. Although the gear box comes from the factory with lubricant, check the level of the lubricant in the cutting unit before operating it and as recommended in the Daily Maintenance Checklist (page 42).

Checking the Mower-Deck Gearbox Lubricant

Service Interval: Every 150 hours

1. Position the machine and mower deck on a level surface.
2. Lower the mower deck to the 2.5 cm (1 inch) height of cut.
3. Disengage the PTO, move the motion-control levers to the NEUTRAL-LOCK position, and engage the parking brake.
4. 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.
5. Lift the footrest, exposing the top of the mower deck.
6. Remove the dipstick/fill plug from the top of the gearbox and make sure that the lubricant is between the marks on the dipstick (Figure 58).

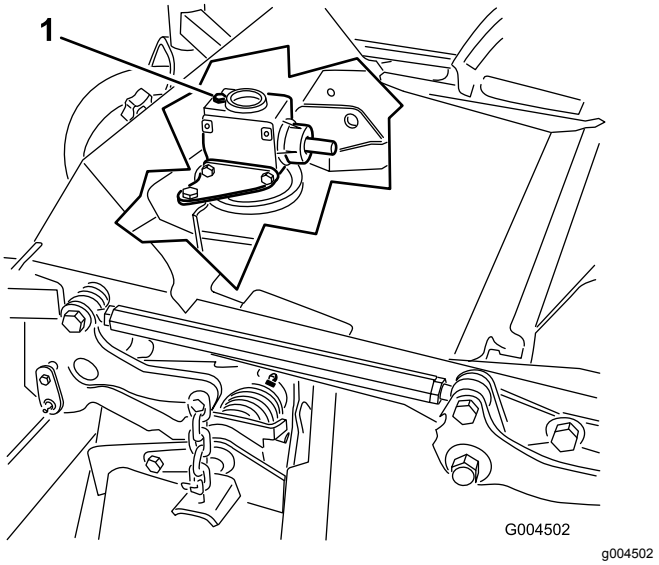


Figure 58

1. Fill plug and dipstick

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

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

Changing the Mower-Deck Gearbox Lubricant

Service Interval: After the first 50 hours
Every 400 hours

1. Position the machine and cutting unit on a level surface.
2. Lower the mower deck to the 2.5 cm (1 inch) height of cut.
3. Disengage the PTO, move the motion-control levers to the NEUTRAL-LOCK position, and engage the parking brake.
4. 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.
5. Lift the footrest, exposing the top of the mower deck.
6. Remove the dipstick/fill plug from the top of the gearbox (Figure 58).
7. Place a funnel and drain pan under the drain plug located under the front of the gearbox and remove the plug, draining the lubricant into the pan.

8. Replace the drain plug.
9. Add enough lubricant, approximately 283 ml (12 oz), until the level is between the marks on the dipstick.

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

Engine Maintenance

Engine Safety

- Shut off the engine before checking the oil or adding oil to the crankcase.
- Do not change the governor speed or overspeed the engine.

Checking the Air Cleaner

1. Check the air-cleaner body for damage, which could possibly cause an air leak. Replace a damaged air-cleaner body.
2. Check the air-intake system for leaks, damage, or loose hose clamps.
3. Service the air-cleaner filter when the air-cleaner indicator shows red and service it more frequently in extremely dusty or dirty conditions (Figure 59).

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

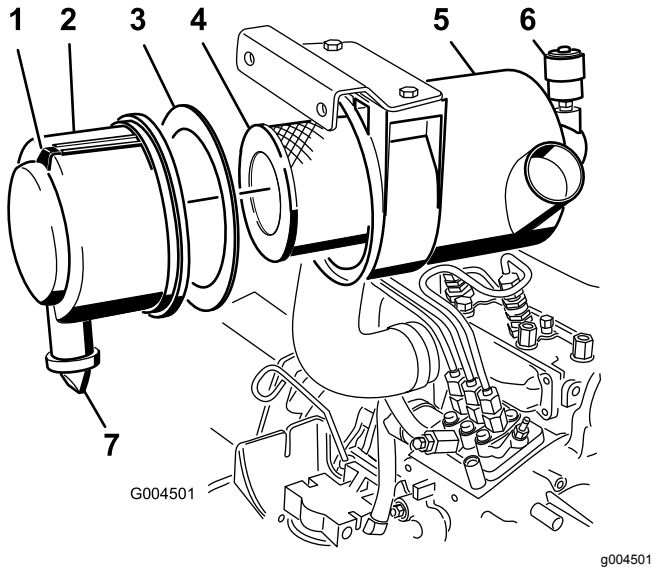


Figure 59

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

4. Be sure that the cover is seated correctly and seals with the air-cleaner body.

Servicing the Air Cleaner

Service Interval: Every 400 hours (more often in dusty or sandy conditions).

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

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

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

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

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

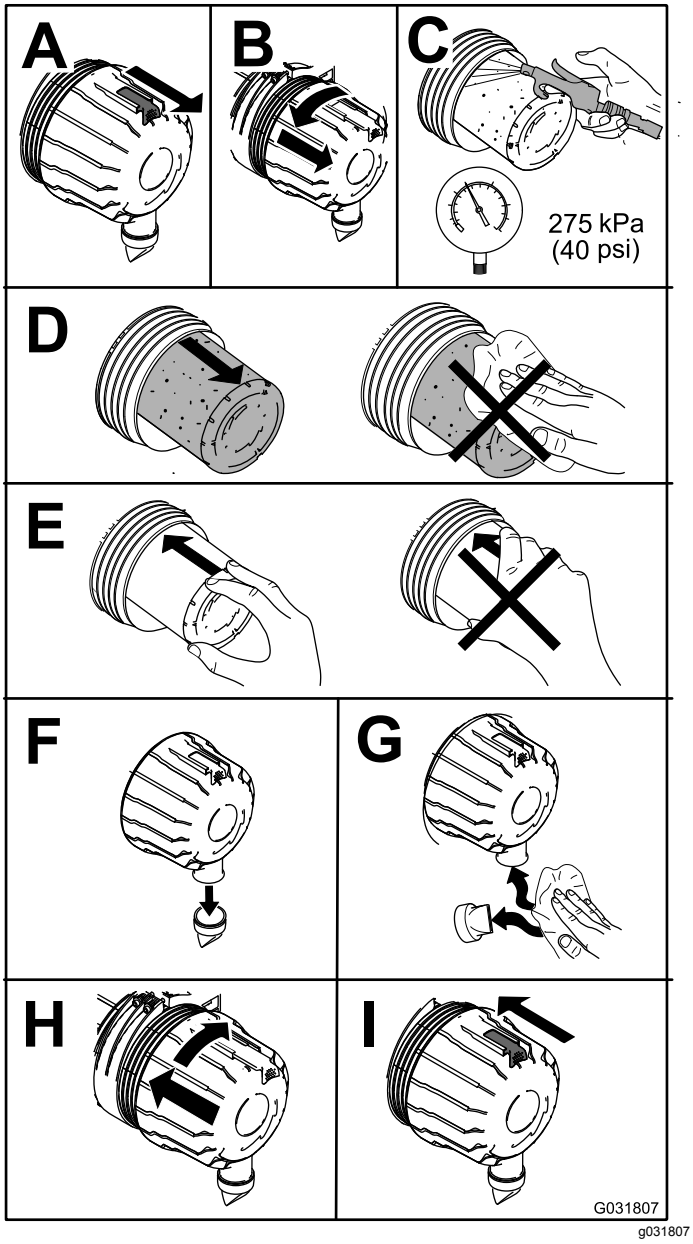


Figure 60

Servicing the Engine Oil

Oil Specification

Use high-quality, low-ash engine oil that meets or exceeds the following specifications:

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

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

Use the following engine oil viscosity grade:

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

Toro Premium Engine Oil is available from your Authorized Toro Distributor in either 15W-40 or 10W-30 viscosity grades. See the parts catalog for part numbers.

Checking the Engine-Oil Level

Service Interval: Before each use or daily

The engine is shipped with oil in the crankcase; however, the oil level must be checked before and after the engine is first started.

Important: **Check the engine oil daily. If the engine-oil level is above the Full mark on the dipstick, the engine oil may be diluted with fuel; If the engine oil level is above the Full mark, change the engine oil.**

The best time to check the engine oil is when the engine is cool before it has been started for the day. If it has already been run, allow the oil to drain back down to the sump for at least 10 minutes before checking. If the oil level is at or below the Add mark on the dipstick, add oil to bring the oil level to the Full mark. **Do not overfill the engine with oil**.

Important: **Keep the engine oil level between the upper and lower limits on the dipstick; the engine may fail if you run it with too much or too little oil.**

1. Park the machine on a level surface.
2. Unlock the hood latches and open the hood.
3. Remove the dipstick, wipe it clean, install the dipstick into the tube, and pull it out again.

   The oil level should be in the safe range (Figure 61).

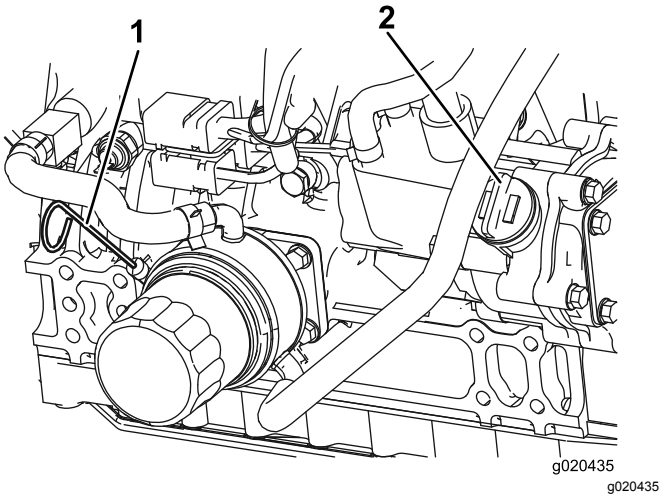


Figure 61

1. Dipstick
2. Oil-fill cap

4. If the oil is below the safe range, remove the fill cap (Figure 61) and add oil until the level reaches the Full mark.

   Important: **Do not overfill the engine with oil.**

   Note: When using different oil, drain all old oil from the crankcase before adding new oil.
5. Install the oil-fill cap and dipstick.
6. Close the hood and secure it with the latches.

Crankcase Oil Capacity

5.2 liters (5.5 qt) with the filter.

Changing the Engine Oil And Filter

Service Interval: Every 250 hours

Change the oil and filter every 250 hours.

1. Remove the engine oil drain plug (Figure 62) and let the oil flow into a drain pan. When all the oil is drained, install the drain plug.

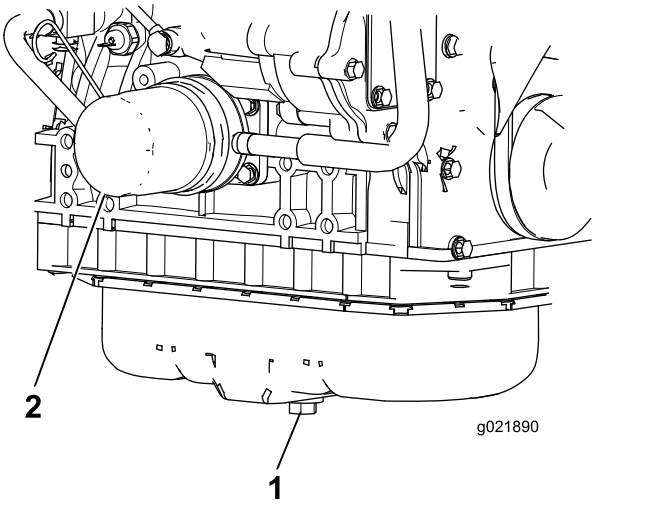


Figure 62

1. Engine oil drain plug
2. Oil filter

2. Remove the oil filter (Figure 62). Apply a light coat of clean oil to the new filter seal before screwing it on. **Do not overtighten.**
3. Add oil to the crankcase; refer to Checking the Engine Oil.

Servicing the Diesel-Oxidation Catalyst (DOC) and the Soot Filter

Service Interval: Every 6,000 hours or clean the soot filter if engine faults SPN 3720 FMI 16, SPN 3720 FMI 0, or SPN 3720 FMI 16 display in the InfoCenter.

- If advisory message ADVISORY 179 displays in the InfoCenter, the DPF is nearing the recommended point for servicing the diesel-oxidation catalyst and the soot filter.

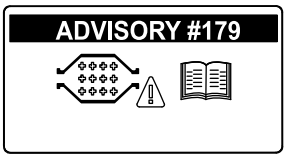


Figure 63

- If engine faults CHECK ENGINE SPN 3251 FMI 0, CHECK ENGINE SPN 3720 FMI 0, or CHECK ENGINE SPN 3720 FMI 16in the InfoCenter (Figure 64) display in the InfoCenter, clean the soot filter using the steps that follow:

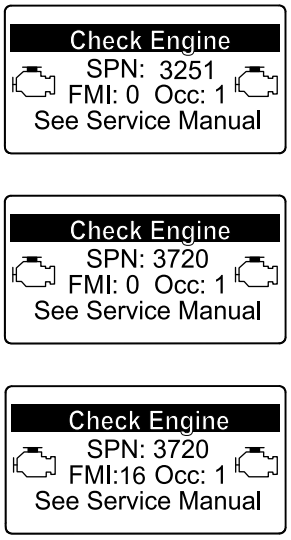


Figure 64

1. Refer to the Engine section in the *Service Manual* for information on disassembling and assembling the diesel-oxidation catalyst and the soot filter of the DPF.
2. Refer to your Authorized Toro Distributor for diesel-oxidation catalyst and the soot filter replacement parts or service.
3. Contact your Authorized Toro Distributor to have them reset the engine ECU after you install a clean DPF.

Fuel System Maintenance

Note: Refer to Fuel Specification (page 17) for proper fuel recommendations.

⚠ DANGER

Under certain conditions, diesel fuel and fuel vapors are highly flammable and explosive. A fire or explosion from fuel can burn you and others and can cause property damage.

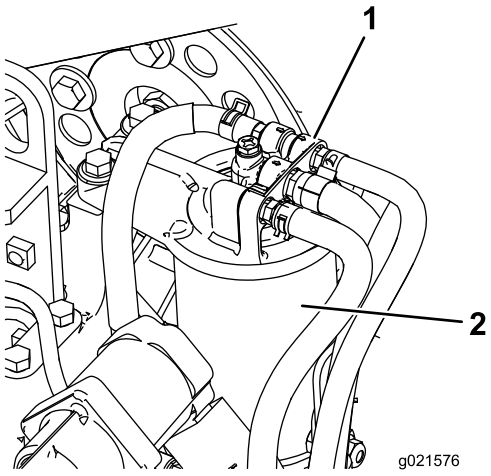
- **Use a funnel and fill the fuel tank outdoors, in an open area, when the engine is off and is cold. Wipe up any fuel that spills.**
- **Do not fill the fuel tank completely full. Add fuel to the fuel tank until the level is to the bottom of the filler neck.**
- **Never smoke when handling fuel, and stay away from an open flame or where fuel fumes may be ignited by a spark.**
- **Store fuel in a clean, safety-approved container and keep the cap in place.**

Servicing the Engine Fuel Filter

Service Interval: Every 400 hours

The engine fuel filter should be replaced after every 400 hours of operation.

1. Clean the area around the fuel filter head (Figure 65).



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Figure 65

1. Fuel Filter head
2. Fuel Filter

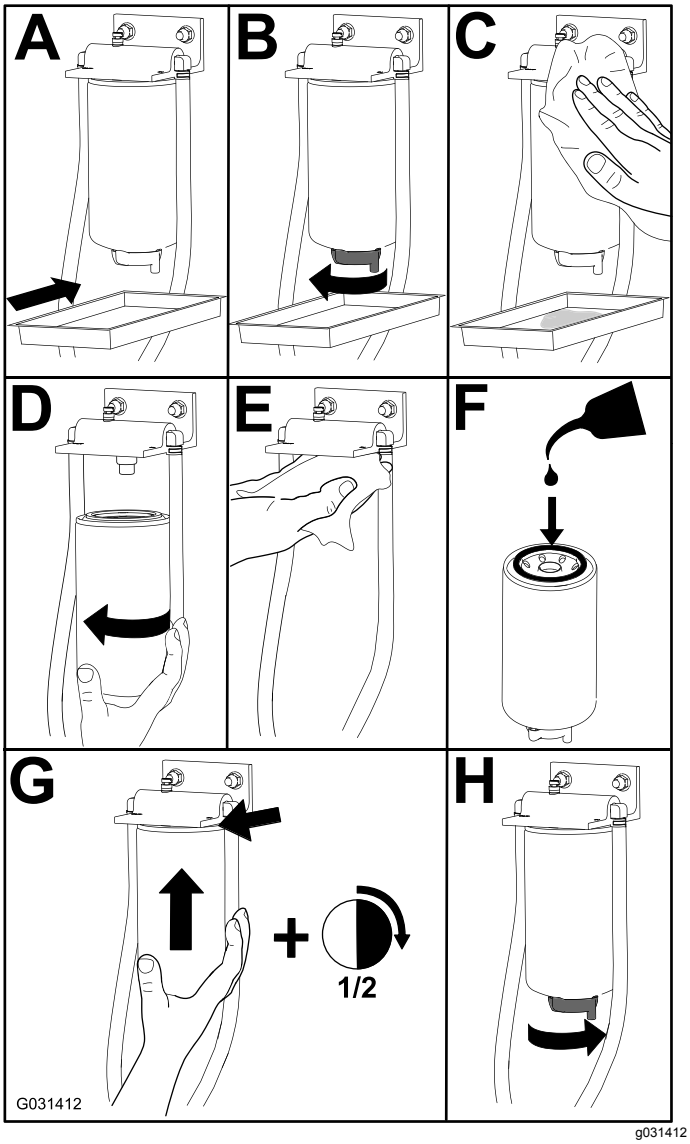
2. Remove the filter and clean the filter head mounting surface (Figure 65).

3. Lubricate the filter gasket with clean lubricating engine oil. Refer to the Engine Operator's Manual, included with the machine, for additional information.
4. Install the dry filter canister, by hand, until the gasket contacts the filter head, then rotate it an additional 1/2 turn.
5. Start the engine and check for fuel leaks around the filter head.

Servicing the Water Separator

Service Interval: Every 400 hours

Every 400 hours



g031412

Figure 66

Cleaning the Fuel Tank

Service Interval: Every 2 years

Remove and clean the in-line strainers after draining the tank. Use clean diesel fuel to flush out the tank.

Important: **Drain and clean the tank if the fuel system becomes contaminated or if you are storing the machine for an extended period.**

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.

WARNING

CALIFORNIA
Proposition 65 Warning

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.

Servicing the Battery

Service Interval: Every 50 hours

Keep the top of the battery clean. If you store the machine in a location where temperatures are extremely high, the battery will run down more rapidly than if the machine is stored in a location where the temperature is cool.

Keep the top of the battery clean by washing it periodically with a brush dipped in ammonia or bicarbonate of soda solution. Flush the top surface with water after cleaning it. Do not remove the fill caps while cleaning the battery.

The battery cables must be tight on the terminals to provide good electrical contact.

If corrosion occurs at the terminals, disconnect the cables, negative (-) cable first, and scrape the clamps and terminals separately. Connect the cables, positive (+) cable first, and coat the terminals with petroleum jelly.

⚠ WARNING

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

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

⚠ WARNING

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

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

Storing the Battery

If you are storing the machine more than 30 days, remove the battery and charge it fully. Either store it on a shelf or on the machine. Do not connect the cables if you store it on the machine. Store the battery in a cool environment to prevent the battery from discharging rapidly. To prevent the battery from freezing, make sure it is fully charged. The specific gravity of a fully charged battery is 1.265 to 1.299.

Checking the Fuses

The fuses are located under the control panel. Access them through the side panel cover (Figure 67). To open the side panel cover, release the 2 latches and pull out on it.

If the machine stops or has other electrical system issues, check the fuses. Grasp each fuse in turn and remove them 1 at a time, checking if any are blown.

Important: **If you need to replace a fuse, always use the same type and amperage-rated fuse as the one you are replacing, otherwise you could damage the electrical system. Refer to the decal next to the fuses for a diagram of each fuse and its amperage (Figure 68).**

Note: If a fuse blows frequently, you probably have a short in the electrical system and should have it serviced by a qualified service technician.

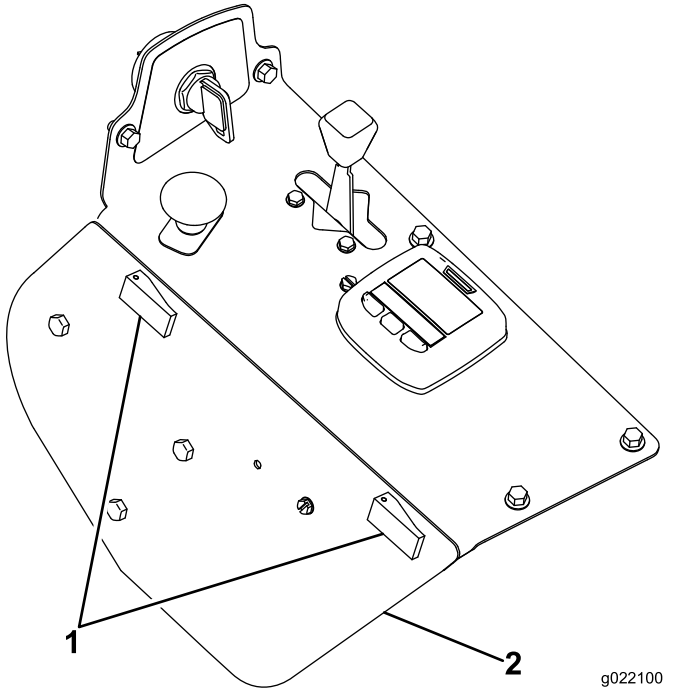
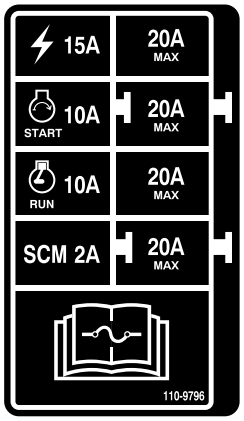


Figure 67

1. Side panel cover
2. Latch



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Figure 68

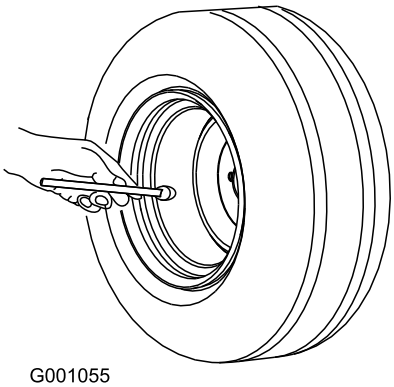
Drive System Maintenance

Checking the Tire Pressure

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

Maintain the air pressure in the front and rear tires (Figure 69). The correct air pressure is 124 kPa (15 psi) in the rear tires and 103 kPa (25 psi) in the caster wheels. Uneven tire pressure can cause an uneven cut.

Note: Check the tires when they are cold to get the most accurate pressure reading.



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Figure 69

Replacing the Caster Wheels and Bearings

1. Obtain a new caster-wheel assembly, cone bearings, and bearing seals from your Authorized Toro Distributor.
2. Remove the locknut from the bolt (Figure 70).

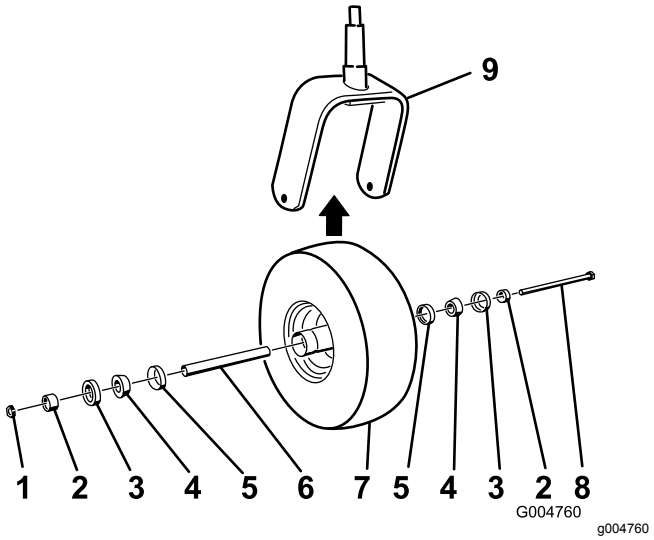


Figure 70

1. Locknut
2. Bearing spacer
3. Outer bearing seal
4. Cone bearing
5. Inner bearing seal
6. Spacer
7. Caster wheel
8. Axle bolt
9. Caster fork

3. Grasp the caster wheel and slide the bolt out of the fork or pivot arm.
4. Discard the old caster wheel and bearings.
5. Assemble the caster wheel by pushing the cone bearings and seals, packed with grease, into the wheel hub, positioned as shown in Figure 70.
6. Slide the spacer into the wheel hub through the bearings, captivating the spacer inside the wheel hub with 2 bearing spacers.

   Important: **Ensure that the seal lips are not folded inward.**
7. Install the caster-wheel assembly between the castor fork and secure it in place with the bolt and locknut.
8. Tighten the locknut until the wheel no longer spins freely, then back it off just until the wheel spins freely.
9. Attach a grease gun to the grease fitting on the caster wheel and fill it with No. 2 lithium grease.

Cooling System Maintenance

Cooling System Safety

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

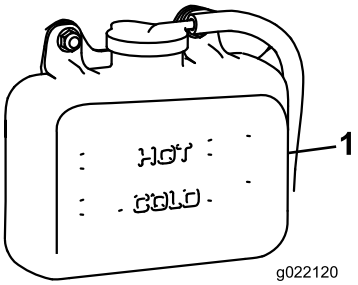
Checking the Cooling System

Service Interval: Before each use or daily

The cooling system is filled with a 50/50 solution of water and permanent ethylene glycol anti freeze. The capacity of the cooling system is 7.5 L (6 US qt).

1. Check the level of the coolant in the expansion tank (Figure 71).

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



g022120

Figure 71

1. Expansion tank

2. If coolant level is low, remove the expansion-tank cap and replenish the system.

   Important: **Do not overfill.**
3. Install the expansion-tank cap.

Cleaning the Radiator

Service Interval: Before each use or daily

Every 1,500 hours—Replace moving hoses.

Every 200 hours—Inspect the cooling-system hoses and seals. Replace them if cracked or torn.

Every 2 years—Flush and replace the cooling-system fluid.

Clean the radiator to prevent the engine from overheating.

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

Clean the radiator as follows:

1. Open the hood.
2. Working from the fan side of the radiator, blow out debris with low pressure (345 kPa or 50 psi), compressed air. Repeat from the front of the radiator and the other fan side.

   Important: **Do not use water.**
3. After you thoroughly clean the radiator, clean out debris that may have collected in the channel at the radiator base.
4. Close the hood.

Brake Maintenance

Adjusting the Parking-Brake Interlock Switch

1. Stop the machine, move the motion-control levers to the NEUTRAL-LOCK position, engage the parking brake, and remove the ignition key.
2. Remove the bolts securing the front panel and remove the panel (Figure 72).

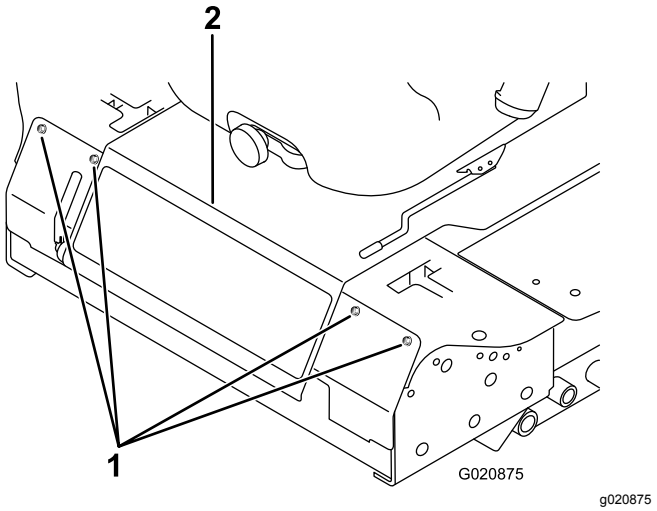


Figure 72

1. Bolt
2. Control panel

3. Loosen the 2 jam nuts securing the parking-brake interlock switch to the mounting bracket.

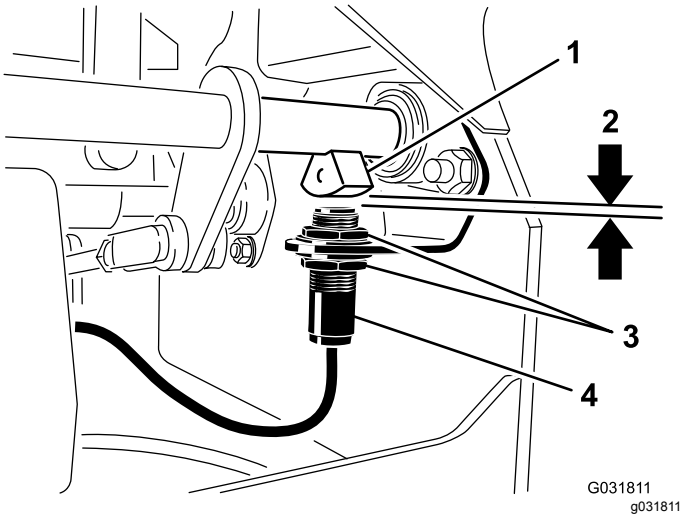


Figure 73

1. Brake-shaft sensor
2. 4 mm (5/32 inch)
3. Jam nut
4. Parking-brake interlock switch

4. Move the switch up or down on the bracket until the distance between the brake-shaft sensor and the switch plunger is 4 mm (5/32 inch) as shown in Figure 73.

   Note: Make sure that the brake-shaft sensor does not contact the switch plunger.

5. Secure the switch jam nuts.
6. Test the adjustment as follows:
   A. Ensure that the parking brake is engaged and you are not sitting on the seat, then start the engine.
   B. Move the control levers out of the NEUTRAL-LOCK position.

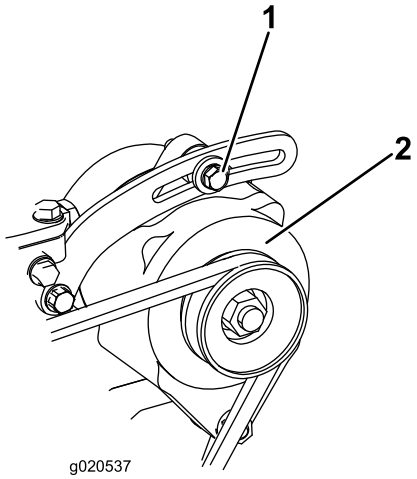
      Note: The engine should shut off. If not, check the adjustment that you made to the switch.
7. Install the front panel.

Belt Maintenance

Checking the Alternator-Belt Tension

Service Interval: Every 100 hours

1. Apply 44 N (10 lb) of force to the alternator belt, midway between the pulleys.
2. If the deflection is not 10 mm (3/8 inch), loosen the alternator mounting bolts (Figure 74).



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Figure 74

1. Mounting bolt
2. Alternator

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

Adjusting the Control-Lever Neutral-Interlock Switch

1. Stop the machine, move the motion-control levers to the NEUTRAL-LOCK position, engage the parking brake, and remove the ignition key.
2. Remove the bolts securing the front panel and remove the panel (Figure 75).

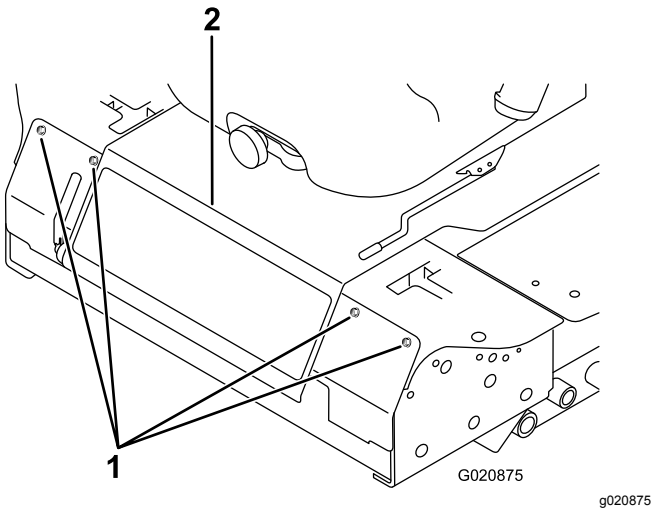


Figure 75

1. Bolt
2. Control panel

3. Loosen the 2 screws securing the interlock switch (Figure 76).

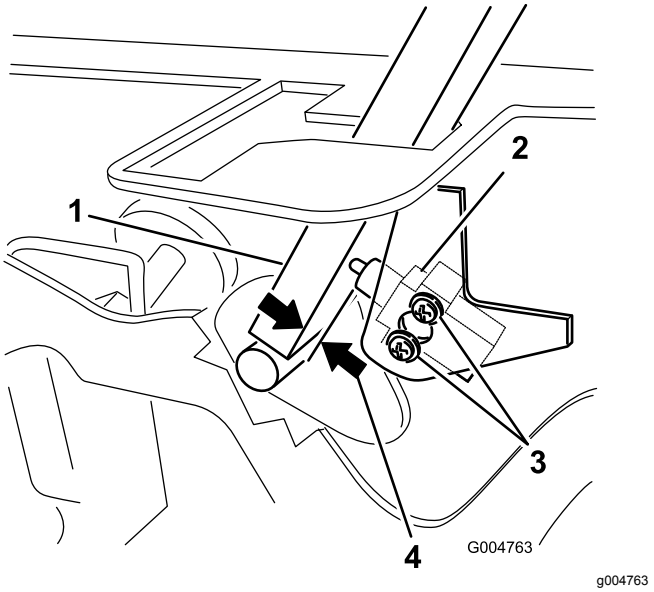


Figure 76

1. Control lever
2. Neutral-interlock switch
3. Screw
4. 0.4 to 1 mm (0.015 to 0.045 inch)

4. Holding the control lever against the frame, move the switch toward the lever until the distance between the lever and switch body is 0.4 to 1 mm (0.015 to 0.045 inch) as shown in Figure 76.
5. Secure the switch.
6. Repeat steps 3 to 5 for the other lever.
7. Install the front panel.

Adjusting the Control-Lever Neutral Return

If the motion-control levers do not align with the neutral slots when released from the REVERSE position, adjustment is required. Adjust each lever, spring, and rod separately.

1. Disengage the PTO, move the control lever to the NEUTRAL-LOCK position, and engage the parking brake.
2. Move the throttle lever to the SLOW position, shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Remove the bolts securing the front panel and remove the panel (Figure 77).

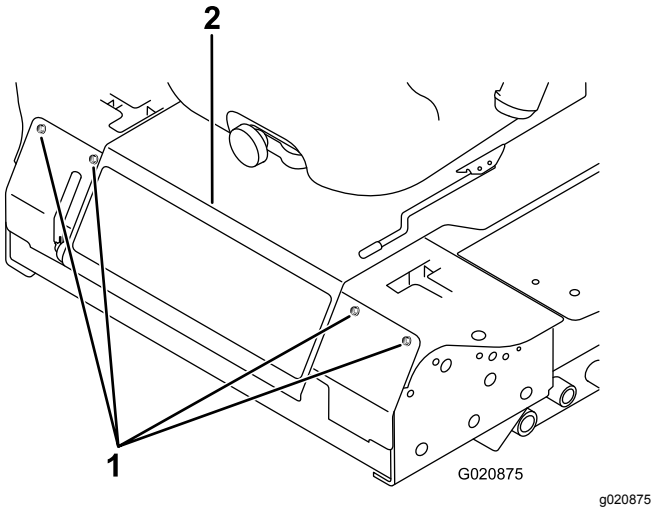


Figure 77

1. Bolt
2. Control panel

4. Move the control lever to the NEUTRAL position but **not locked** (Figure 79).
5. Pull the lever back until the clevis pin (on an arm above the pivot shaft) contacts the end of the slot (just beginning to put pressure on the spring) as shown in Figure 78.

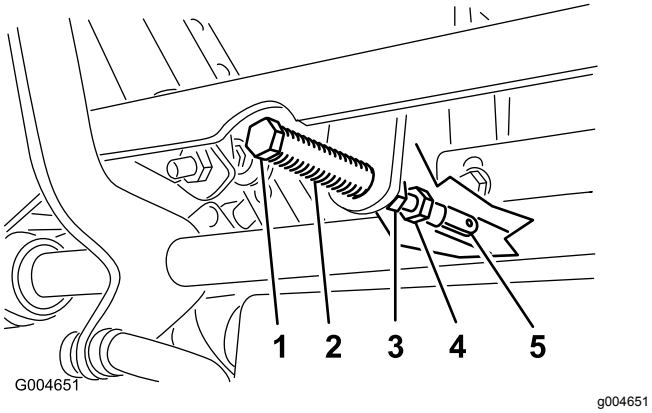


Figure 78

1. Clevis pin
2. Slot
3. Jam nut
4. Adjustment bolt
5. Yoke

6. Check where the control lever is relative to notch in the console (Figure 79).

   Note: The control lever should be centered, allowing lever to pivot outward to the NEUTRAL-LOCK position.

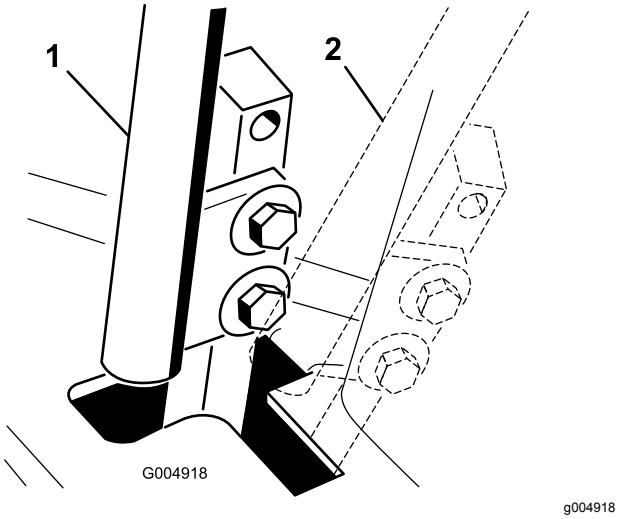


Figure 79

1. NEUTRAL position
2. NEUTRAL-LOCK position

7. If adjustment is needed, loosen the nut and jam nut against the yoke (Figure 78).
8. Applying slight rearward pressure on the motion-control lever, turn the head of the adjustment bolt in the appropriate direction until the control lever is centered in the NEUTRAL-LOCK position (Figure 78).

   Note: Rearward pressure on the lever keeps the pin at the end of the slot and allow the adjustment bolt to move the lever to the appropriate position.
9. Tighten the nut and jam nut (Figure 78).
10. Repeat steps 4 through 9 for the other control lever.
11. Install the front panel.

Adjusting the Traction Drive for Neutral

Make this adjustment with the drive wheels turning.

⚠ DANGER

Mechanical or hydraulic jacks may fail to support the machine and cause a serious injury.

- **Use jack stands when supporting the machine.**
- **Do not use hydraulic jacks.**

⚠ WARNING

The engine must be running to perform this adjustment. Contact with moving parts or hot surfaces may cause personal injury.

Keep hands, feet, face, clothing, and other body parts away from rotating parts, muffler, and other hot surfaces.

1. Raise the frame onto stable jack stands so that the drive wheels can rotate freely.
2. Slide the seat forward, unlatch it, and swing it up and forward.
3. Disconnect the electrical connector from the seat safety switch.
4. Temporarily install a jumper wire across the terminals in the wire harness connector.
5. Start the engine, ensure that the throttle lever is midway between the FAST and SLOW positions, and release the parking brake.

   Note: The motion-control levers must be in the NEUTRAL-LOCK position while you make any adjustments.
6. Adjust the pump rod length on one side by rotating the hex shaft, in the appropriate direction, until the corresponding wheel is still or slightly creeping in reverse (Figure 80).

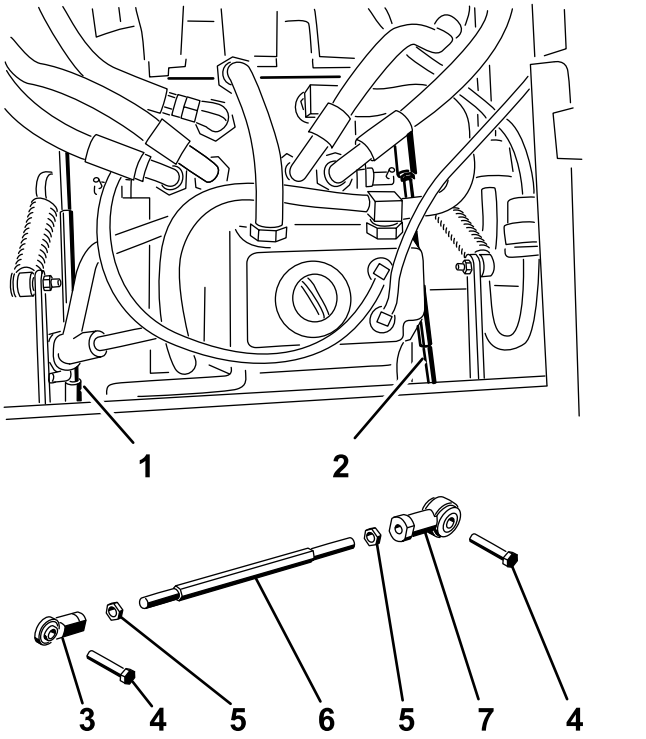


Figure 56
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Figure 80

1. Right pump rod
2. Left pump rod
3. Ball joint
4. Bolt
5. Jam nut
6. Hex shaft
7. Ball joint

7. Move the motion-control lever forward and reverse, then back to neutral.

   Note: The wheel must stop turning or slightly creep in reverse.
8. Move the throttle lever to the FAST position.

   Note: Make sure that the wheel remains stopped or slightly creeps in reverse; adjust it if necessary.
9. Repeat steps 6 through 8 for the other side of the machine.
10. Tighten the jam nuts at the ball joints (Figure 78).
11. Move the throttle lever to the SLOW position and shut off the engine.
12. Remove the jumper wire from the wire harness connector and plug the connector into the seat switch.

⚠ WARNING

The electrical system does not perform proper safety shutoff with the jumper wire installed.

- **Remove the jumper wire from the wire harness connector and plug the connector into the seat switch when you complete adjustment.**
- **Never operate the machine with the jumper installed and the seat switch bypassed.**

13. Lower the seat into position.
14. Remove the jack stands.

Adjusting the Maximum Ground Speed

1. Disengage the PTO, move the motion-control levers to the NEUTRAL-LOCK position, and engage the parking brake.
2. Move the throttle lever to the SLOW position, shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Remove the bolts securing the front panel and remove the panel (Figure 81).

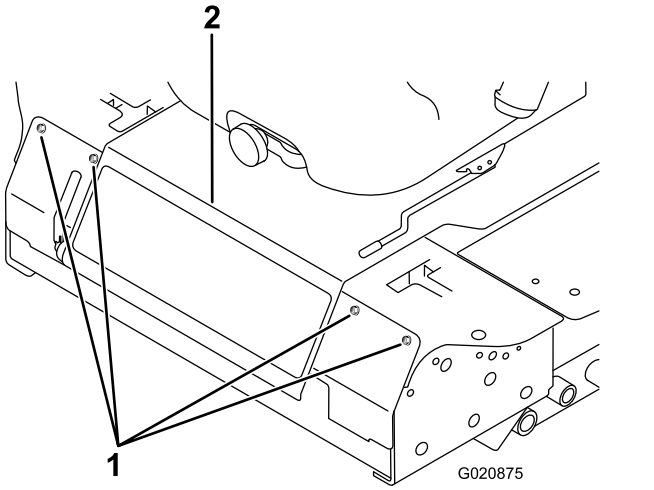


Figure 81

1. Bolt
2. Control panel

4. Loosen the jam nut on the stop bolt for a control lever (Figure 82).

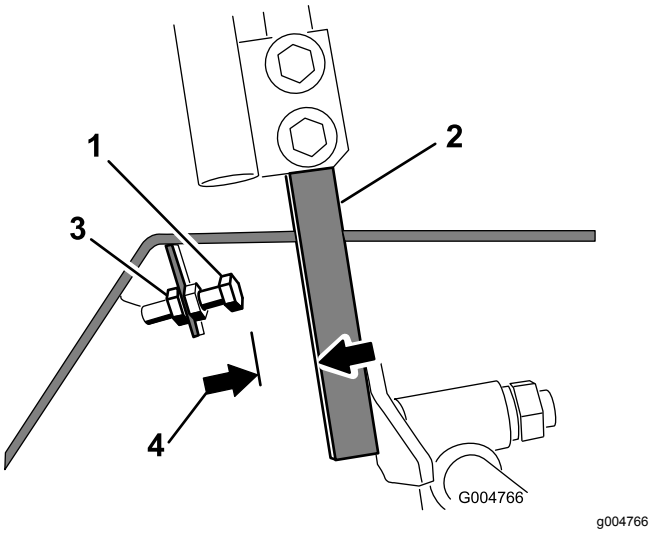


Figure 82

1. Stop bolt
2. Control lever
3. Jam nut
4. 1.5 mm (0.060 inch)

5. Thread the stop bolt all the way in (away from the control lever).
6. Push the control lever all the way forward until it stops and hold it there.
7. Thread the stop bolt out (toward the control lever) until there is a gap of 1.5 mm (0.060 inch) between the head of the stop bolt and the control lever.

   Note: If you want to reduce the maximum machine speed, back each stop bolt out an equal amount toward the control lever until you reach the desired maximum speed. You may need to test your adjustment several times.
8. Tighten the jam nut to secure the stop bolt in place.
9. Repeat steps 4 through 8 for the other control lever.
10. Install the front panel.
11. Ensure that the machine drives straight and does not turn when both control levers are pushed all the way forward.

    Note: If the machine turns, the stop bolts are not evenly set and you need to adjust them further.

Adjusting the Tracking

1. Disengage the PTO, move the motion-control levers to the NEUTRAL-LOCK position, and engage the parking brake.
2. Move the throttle lever to the SLOW position, shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Loosen the bolts securing the control levers (Figure 83).

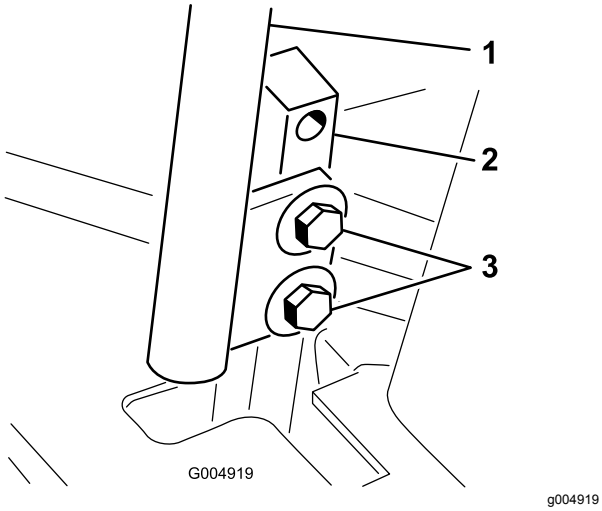


Figure 83

1. Control lever
2. Control-lever post
3. Bolts

4. Have someone push the control-lever posts (not the control levers) all the way forward into the maximum-speed position and hold them there.
5. Adjust the control levers so that they line up and tighten the bolts, securing the levers to the posts (Figure 84).

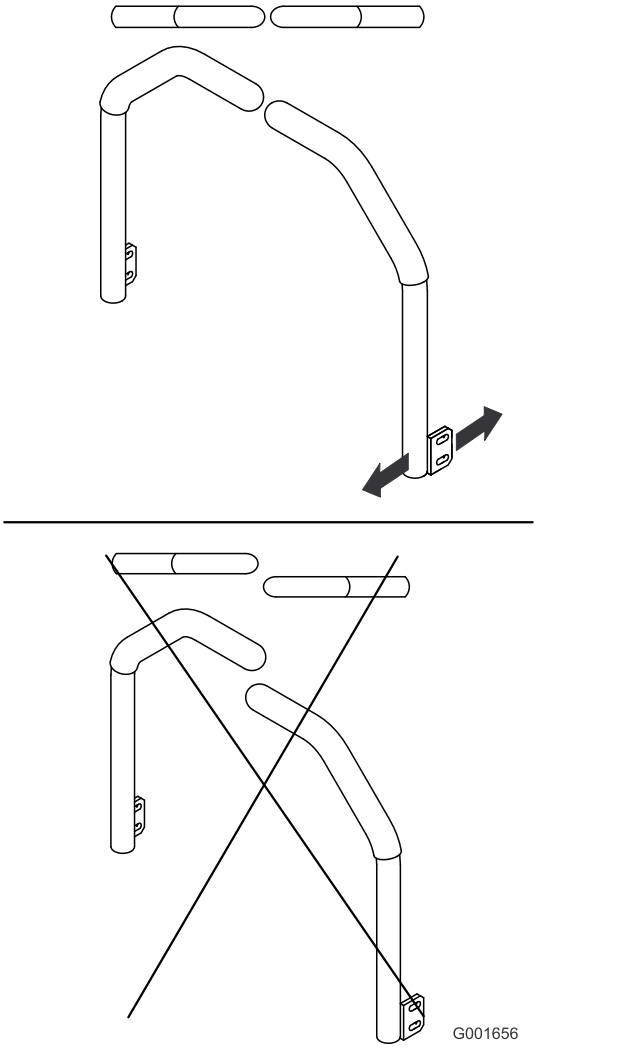


Figure 84

Hydraulic System Maintenance

The reservoir is filled at the factory with approximately 4.7 liters (5 quarts) of high quality tractor transmission/hydraulic fluid. The recommended replacement fluid is as follows:

Toro Premium Transmission/Hydraulic Tractor Fluid
(Available in 5 gallon pails or 55 gallon drums. See parts catalog or Toro distributor for part numbers.)

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

Note: Toro will 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 oil is available in 20 ml (2/3 oz) bottles. One bottle is sufficient for 15-22 liters (4-6 gallons) of hydraulic fluid. Order part number 44-2500 from your Authorized Toro Distributor.

Hydraulic System Safety

- **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.**
- **Seek immediate medical attention if fluid is injected into skin. Injected fluid must be surgically removed within a few hours by a doctor.**

Checking the Hydraulic System

Service Interval: Before each use or daily

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

1. Position the machine on a level surface.
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 the system of air.

   Important: **Do not engage the PTO.**
3. Raise the deck to extend the lift cylinders, shut off the engine, and remove the key.
4. Raise the seat to access the hydraulic fluid tank.
5. Remove the hydraulic fill cap from the filler neck (Figure 85).

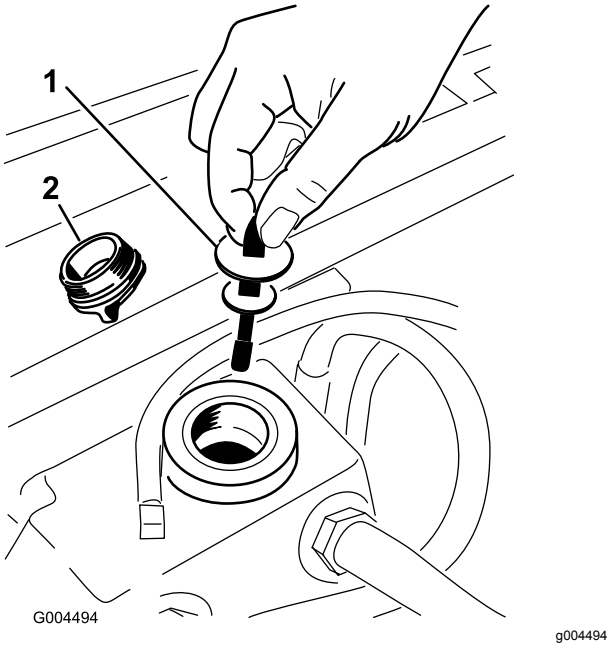


Figure 85

1. Dipstick
2. Fill cap

6. Remove the dipstick and wipe it with a clean rag (Figure 85).
7. Place the dipstick into the filler neck; then remove it and check the level of fluid (Figure 85).

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

   Important: **Do not overfill.**
8. Replace the dipstick and thread the fill cap finger-tight onto the filler neck.
9. Check all hoses and fittings for leaks.

Changing the Hydraulic Fluid And Filter

Service Interval: After the first 200 hours

Every 800 hours

1. Disengage the PTO, move the motion-control levers to the NEUTRAL-LOCK position, and engage the parking brake.
2. Move the throttle lever to the SLOW position, shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Place a large pan under the hydraulic reservoir and transmission case and remove the plugs, draining all of the hydraulic fluid (Figure 86).

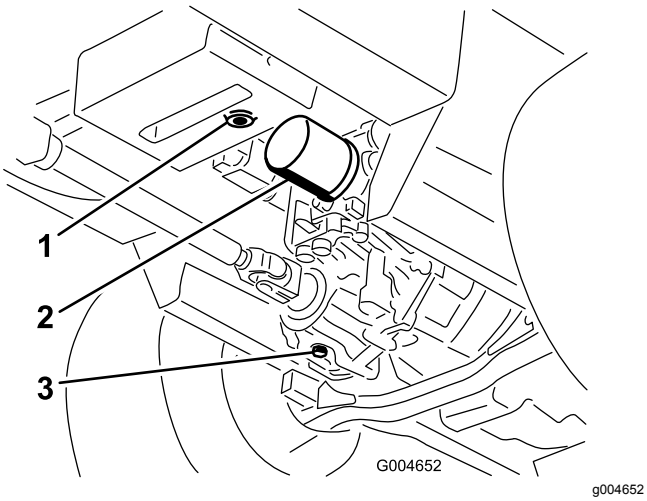


Figure 86

1. Hydraulic-reservoir drain plug
2. Filter
3. Transmission-case drain plug

4. Clean the area around the hydraulic fluid filter and remove the filter (Figure 86).
5. Immediately install a new hydraulic fluid filter.
6. Install the hydraulic-reservoir and transmission-case drain plugs.
7. Fill the reservoir to the proper level (approximately 5.7 L or 6 US qt); refer to Checking the Hydraulic System (page 60).
8. Start the engine and check for oil leaks. Allow the engine to run for about 5 minutes, then shut it off.
9. After 2 minutes, check the level of the hydraulic fluid; refer to Checking the Hydraulic System (page 60).

Cleaning

Cleaning Under the Mower

Service Interval: Before each use or daily

1. Disengage the PTO, move the motion-control levers to the NEUTRAL-LOCK position, and engage the parking brake.
2. Move the throttle lever to the SLOW position, shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Raise the mower to the transport position.
4. Raise the front of the machine using jack stands.
5. Thoroughly clean the underside of the mower with water.

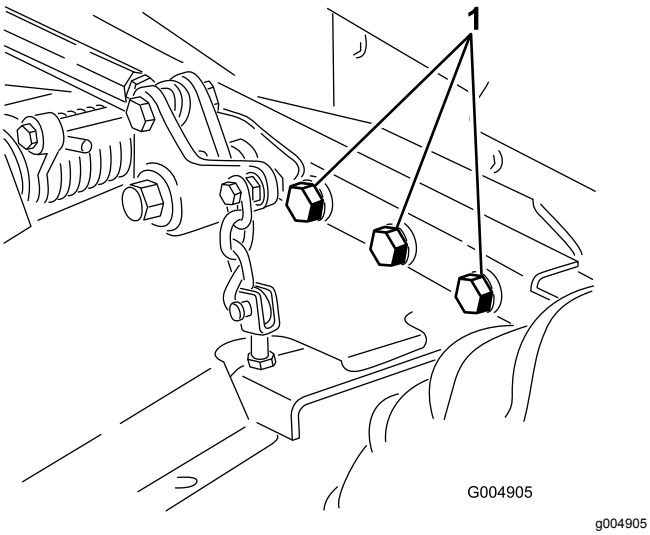
Disposing of Waste

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

Storage

Machine

1. Thoroughly clean the machine, deck, and engine, paying special attention to these areas:
   - Radiator and radiator screen
   - Underneath the deck
   - Under the deck belt covers
   - Counterbalance springs
   - PTO-shaft assembly
   - All grease fittings and pivot points
   - Inside the control box
   - Beneath the seat plate and top of the transmission
2. Check and adjust front and rear tire pressure; refer to Checking the Tire Pressure (page 51).
3. Remove, sharpen, and balance the mower blades. Install the blades and torque the blade fasteners to 115 to 149 N·m (85 to 110 ft-lb).
4. Check all fasteners for looseness and tighten them as necessary. Torque the 6 bolts securing the mower deck frame to the traction unit (Figure 87) to 359 N·m (265 ft-lb).



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Figure 87

Right side not shown.

1. Bolts

5. Grease or oil all grease fittings, pivot points, and transmission-bypass-valve pins. Wipe off any excess lubricant.
6. Lightly sand and use touch up paint on painted areas that are scratched, chipped or rusted. Repair any dents in the metal body.
7. Service the battery and cables as follows:
   A. Remove the battery terminals from the battery posts.
   B. Clean the battery, terminals, and posts with a wire brush and baking soda solution.
   C. Coat the cable terminals and battery posts with Grafo 112X skin-over grease (Toro Part No. 505-47) or petroleum jelly to prevent corrosion.
   D. Slowly recharge the battery for 24 hours every 60 days to prevent lead sulfation of the battery.

Engine

1. Drain the engine oil from the oil pan and replace the drain plug.
2. Replace the oil filter.
3. Fill the engine with the recommended motor oil.
4. Start the engine and run it at idle speed for 2 minutes.
5. Drain the fuel from the fuel tank, fuel lines, pump, filter, and separator. Flush the fuel tank with clean diesel fuel and connect all fuel lines.
6. Thoroughly clean and service the air-cleaner assembly.
7. Seal the air-cleaner inlet and the exhaust outlet with weather proof masking tape.
8. Check the oil filler cap and fuel-tank cap to ensure that they are securely in place.

Notes:

The Toro Warranty

A Two-Year Limited Warranty

Conditions and Products Covered

The Toro Company and its affiliate, Toro Warranty Company, pursuant to an agreement between them, jointly warrant your Toro Commercial product ("Product") to be free from defects in materials or workmanship for two years or 1500 operational hours*, whichever occurs first. This warranty is applicable to all products with the exception of Aerators (refer to separate warranty statements for these products). Where a warrantable condition exists, we will repair the Product at no cost to you including diagnostics, labor, parts, and transportation. This warranty begins on the date the Product is delivered to the original retail purchaser.
* Product equipped with an hour meter.

Instructions for Obtaining Warranty Service

You are responsible for notifying the Commercial Products Distributor or Authorized Commercial Products Dealer from whom you purchased the Product as soon as you believe a warrantable condition exists. If you need help locating a Commercial Products Distributor or Authorized Dealer, or if you have questions regarding your warranty rights or responsibilities, you may contact us at:

Toro Commercial Products Service Department
Toro Warranty Company
8111 Lyndale Avenue South
Bloomington, MN 55420-1196

952–888–8801 or 800–952–2740
E-mail: commercial.warranty@toro.com

Owner Responsibilities

As the Product owner, you are responsible for required maintenance and adjustments stated in your *Operator's Manual*. Failure to perform required maintenance and adjustments can be grounds for disallowing a warranty claim.

Items and Conditions Not Covered

Not all product failures or malfunctions that occur during the warranty period are defects in materials or workmanship. This warranty does not cover the following:

- Product failures which result from the use of non-Toro replacement parts, or from installation and use of add-on, or modified non-Toro branded accessories and products. A separate warranty may be provided by the manufacturer of these items.
- Product failures which result from failure to perform recommended maintenance and/or adjustments. Failure to properly maintain your Toro product per the Recommended Maintenance listed in the *Operator's Manual* can result in claims for warranty being denied.
- Product failures which result from operating the Product in an abusive, negligent, or reckless manner.
- Parts subject to consumption through use unless found to be defective. Examples of parts which are consumed, or used up, during normal Product operation include, but are not limited to, brake pads and linings, clutch linings, blades, reels, rollers and bearings (sealed or greasable), bed knives, spark plugs, castor wheels and bearings, tires, filters, belts, and certain sprayer components such as diaphragms, nozzles, and check valves, etc.
- Failures caused by outside influence. Conditions considered to be outside influence include, but are not limited to, weather, storage practices, contamination, use of unapproved fuels, coolants, lubricants, additives, fertilizers, water, or chemicals, etc.
- Failure or performance issues due to the use of fuels (e.g. gasoline, diesel, or biodiesel) that do not conform to their respective industry standards.
- Normal noise, vibration, wear and tear, and deterioration.
- Normal "wear and tear" includes, but is not limited to, damage to seats due to wear or abrasion, worn painted surfaces, scratched decals or windows, etc.

Parts

Parts scheduled for replacement as required maintenance are warranted for the period of time up to the scheduled replacement time for that part. Parts replaced under this warranty are covered for the duration of the original product warranty and become the property of Toro. Toro will make the final decision whether to repair any existing part or assembly or replace it. Toro may use remanufactured parts for warranty repairs.

Deep Cycle and Lithium-Ion Battery Warranty:

Deep cycle and Lithium-Ion batteries have a specified total number of kilowatt-hours they can deliver during their lifetime. Operating, recharging, and maintenance techniques can extend or reduce total battery life. As the batteries in this product are consumed, the amount of useful work between charging intervals will slowly decrease until the battery is completely worn out. Replacement of worn out batteries, due to normal consumption, is the responsibility of the product owner. Battery replacement may be required during the normal product warranty period at owner's expense. Note: (Lithium-Ion battery only): A Lithium-Ion battery has a part only prorated warranty beginning year 3 through year 5 based on the time in service and kilowatt hours used. Refer to the *Operator's Manual* for additional information.

Maintenance is at Owner's Expense

Engine tune-up, lubrication, cleaning and polishing, replacement of filters, coolant, and completing recommended maintenance are some of the normal services Toro products require that are at the owner's expense.

General Conditions

Repair by an Authorized Toro Distributor or Dealer is your sole remedy under this warranty.

Neither The Toro Company nor Toro Warranty Company is liable for indirect, incidental or consequential damages in connection with the use of the Toro Products covered by this warranty, including any cost or expense of providing substitute equipment or service during reasonable periods of malfunction or non-use pending completion of repairs under this warranty. Except for the Emissions warranty referenced below, if applicable, there is no other express warranty. All implied warranties of merchantability and fitness for use are limited to the duration of this express warranty.

Some states do not allow exclusions of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above exclusions and limitations may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Note regarding engine warranty:

The Emissions Control System on your Product may be covered by a separate warranty meeting requirements established by the U.S. Environmental Protection Agency (EPA) and/or the California Air Resources Board (CARB). The hour limitations set forth above do not apply to the Emissions Control System Warranty. Refer to the Engine Emission Control Warranty Statement supplied with your product or contained in the engine manufacturer's documentation for details

Countries Other than the United States or Canada

Customers who have purchased Toro products exported from the United States or Canada should contact their Toro Distributor (Dealer) to obtain guarantee policies for your country, province, or state. If for any reason you are dissatisfied with your Distributor's service or have difficulty obtaining guarantee information, contact the Toro importer.

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