Form No. 3465-471 Rev B

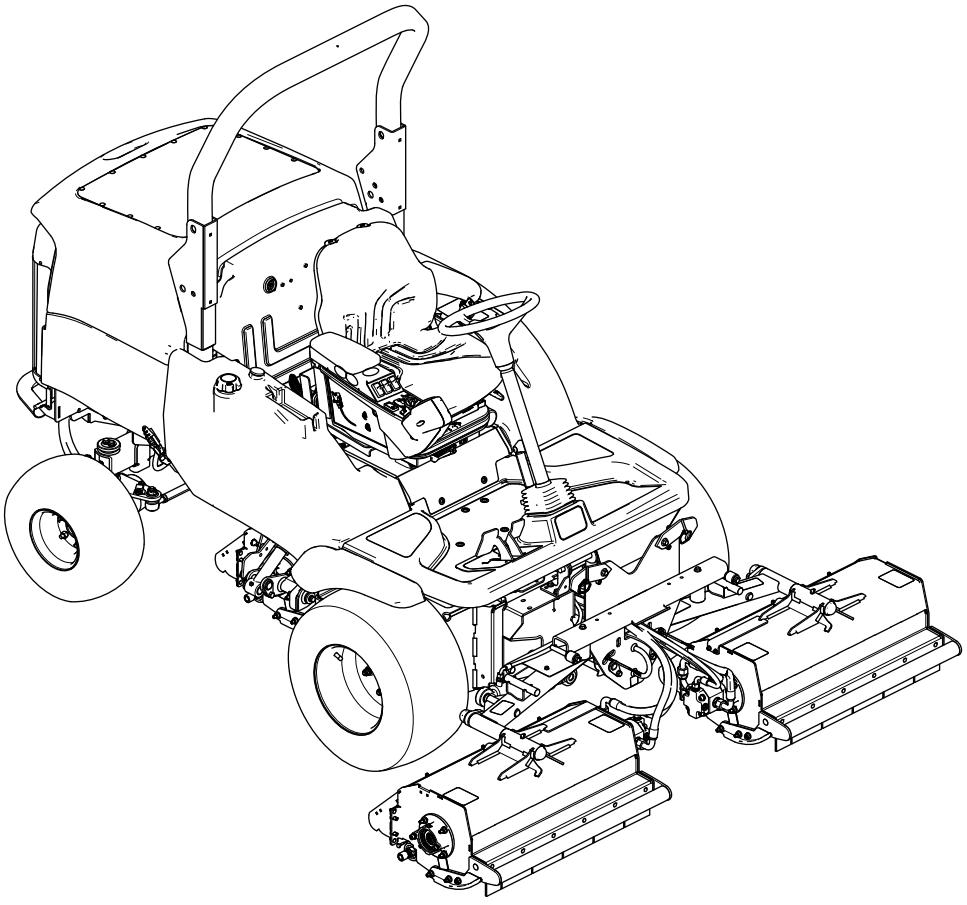
TORO®

Count on it.

Operator's Manual

LT-F3000 Triple Flail Mower

Model No. 31659—Serial No. 418949551 and Up



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

CE UK CA

3465-471

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

Introduction

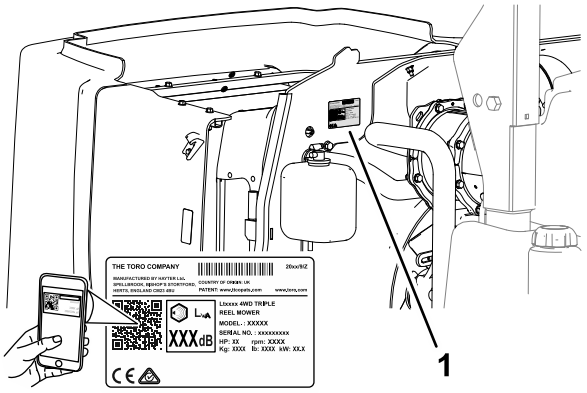
This machine is a ride-on, flail-blade lawn mower intended to be used by professional, hired operators in commercial applications. It is primarily designed for cutting grass on well-maintained turf. Using this product for purposes other than its intended use could prove dangerous to you and bystanders.

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

Visit www.toro.com/en-gb for more information, including safety tips, training materials, accessory information, help finding a dealer, or to register your product.

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

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



g329968

Figure 1

1. Model and serial number location

Model No. _____

Serial No. _____

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Safety

General Safety

This product is capable of amputating hands and feet and of throwing objects.

- Read and understand the contents of this *Operator's Manual* before starting the engine.
- Use your full attention while operating the machine. Do not engage in any activity that causes distractions; otherwise, injury or property damage may occur.
- Do not 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 functioning properly on the machine.
- Keep bystanders and children out of the operating area. Never allow children to operate the machine.
- Shut off the engine, remove the key, and wait for all movement to stop before you leave the operator's position. Allow the machine to cool before adjusting, servicing, cleaning, or storing it.

Safety-Alert Symbol

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



g000502

Figure 2

Safety-alert symbol

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

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

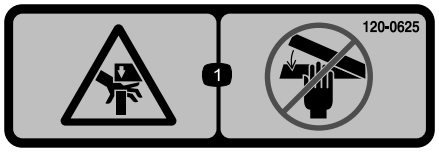
WARNING indicates a potentially hazardous situation which, if not avoided, **could** result in death or serious injury.

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

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

Safety and Instructional Decals

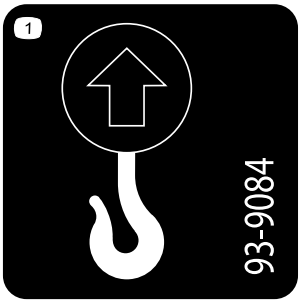
Safety decals and instructions are easily visible to the operator and are located near any area of potential danger. Replace any decal that is damaged or missing.



decal120-0625

120-0625

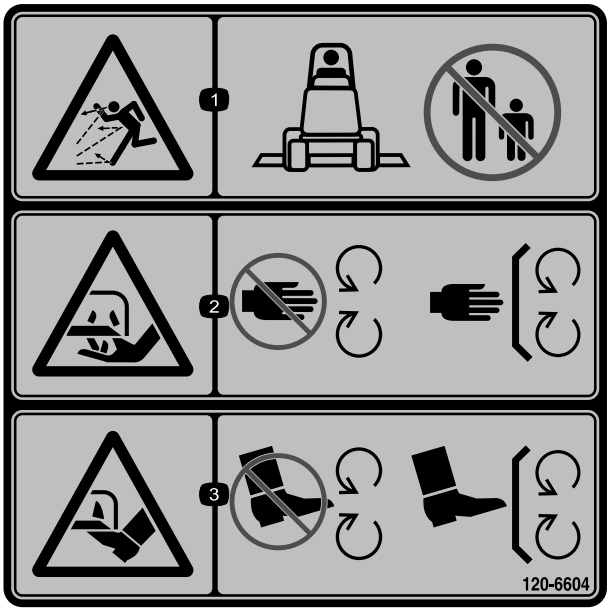
1. Pinch point, hand—keep hands away.



decal93-9084

93-9084

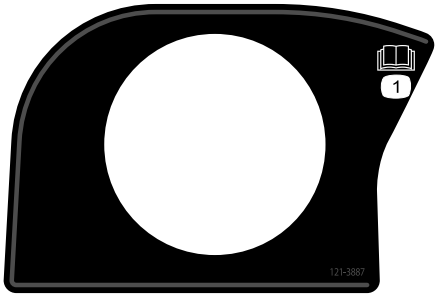
1. Lift point/Tie-down point



decal120-6604

120-6604

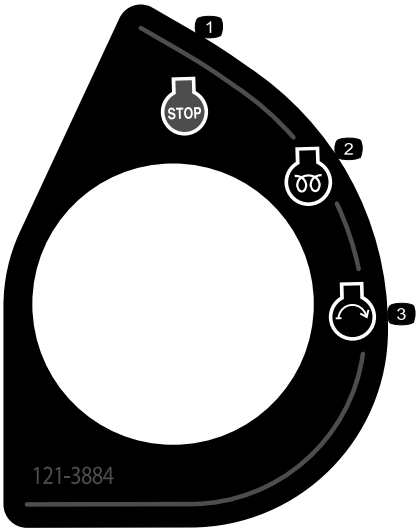
1. Thrown object hazard—keep bystanders away from the machine.
2. Cutting/dismemberment hazard of hand, mower blade—stay away from moving parts; keep all guards and shields in place.
3. Cutting/dismemberment hazard of foot, mower blade—stay away from moving parts; keep all guards and shields in place.



decal121-3887

121–3887

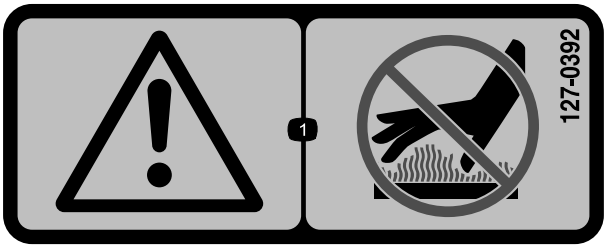
1. Read the *Operator's Manual*.



decal121-3884

121–3884

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



decal127-0392

127-0392

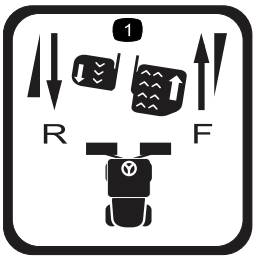
1. Warning—stay away from hot surfaces.



decal111-3562

111-3562

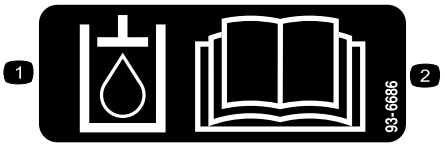
1. Press the pedal to adjust the steering wheel angle.



decal111-3567

111-3567

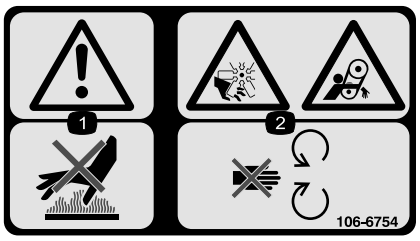
1. Pedal operation



decal93-6686

93-6686

1. Hydraulic oil
2. Read the *Operator's Manual.*



decal106-6754

106-6754

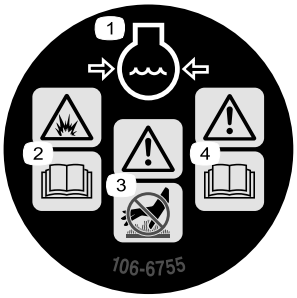
1. Warning—do not touch the hot surface.
2. Cutting/dismemberment hazard, fan; entanglement hazard, belt—stay away from moving parts.



decal111-9648

111-9648

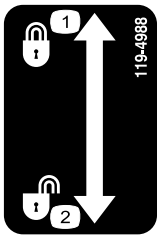
1. Warning—read the *Operator's Manual*; torque the nuts to 45 N·m (33 ft-lb).



decal106-6755

106-6755

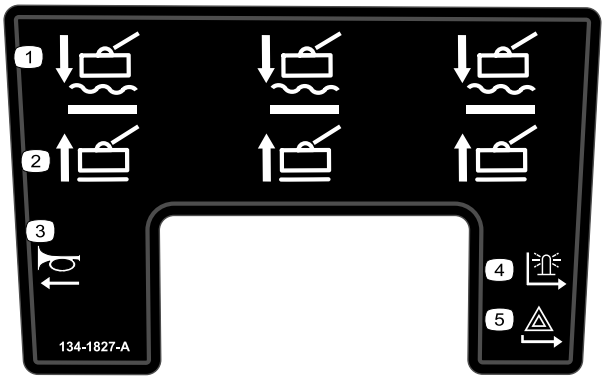
1. Engine coolant under pressure.
2. Explosion hazard—read the *Operator's Manual.*
3. Warning—do not touch the hot surface.
4. Warning—read the *Operator's Manual.*



decal119-4988

119-4988

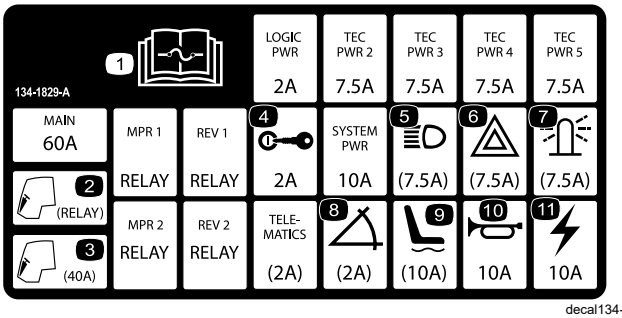
1. Lock
2. Unlock



decal134-1827

134-1827

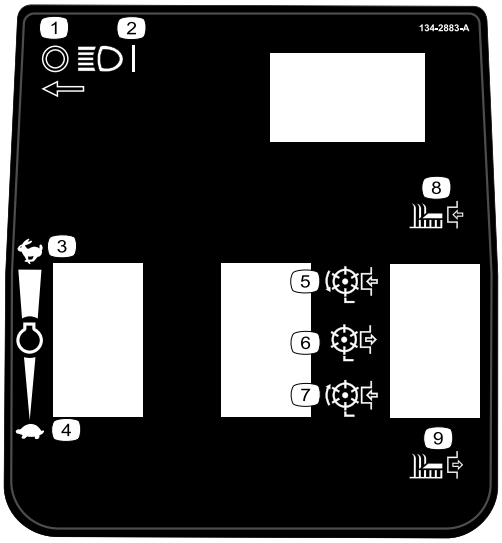
1. Cutting units—lower/float
2. Cutting units—raise
3. Horn
4. Beacon
5. Hazard warning light



decal134-1829

134-1829

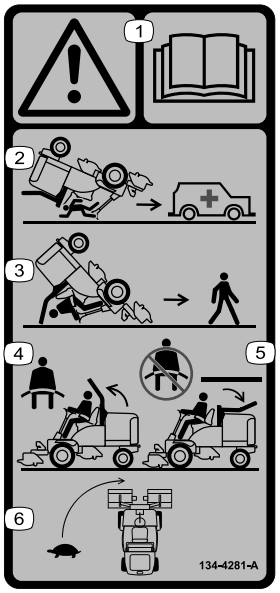
1. Read the *Operator's Manual* for information on fuses.
2. Cab—relay
3. Cab—40 A
4. Key switch—2 A
5. Headlights—7.5 A
6. Hazard warning light—7.5 A
7. Beacon—7.5 A
8. Slope sensor—2 A
9. Power seat—10 A
10. Horn—10 A
11. Power—10 A



decal134-2883

134-2883

1. Headlights—off
2. Headlights—on
3. Engine speed—fast
4. Engine speed—slow
5. Cutting unit drive—forward
6. Cutting unit drive—off
7. Cutting unit drive—reverse
8. Cutting unit—on
9. Cutting unit—off



decal134-4281

134-4281

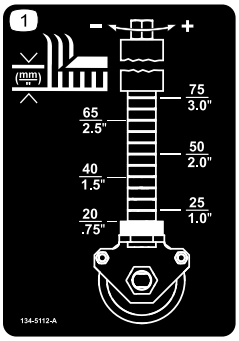
1. Warning—read the *Operator's Manual*.
2. There is no rollover protection when the roll bar is down.
3. There is rollover protection when the roll bar is up.
4. If the roll bar is raised, wear the seat belt.
5. If the roll bar is not raised, do not wear the seat belt.
6. Drive slowly when turning.



decal134-4539

134-4539

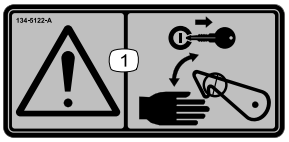
1. Falling, crushing hazard—ensure that the operator-platform latch is engaged before operating.



decal134-5112

134-5112

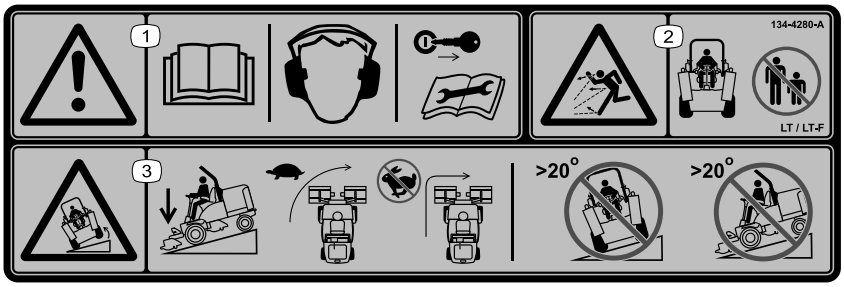
1. Height of cut



decal134-5122

134-5122

1. Warning—shut off the engine and remove the key before releasing or operating the safety latches.

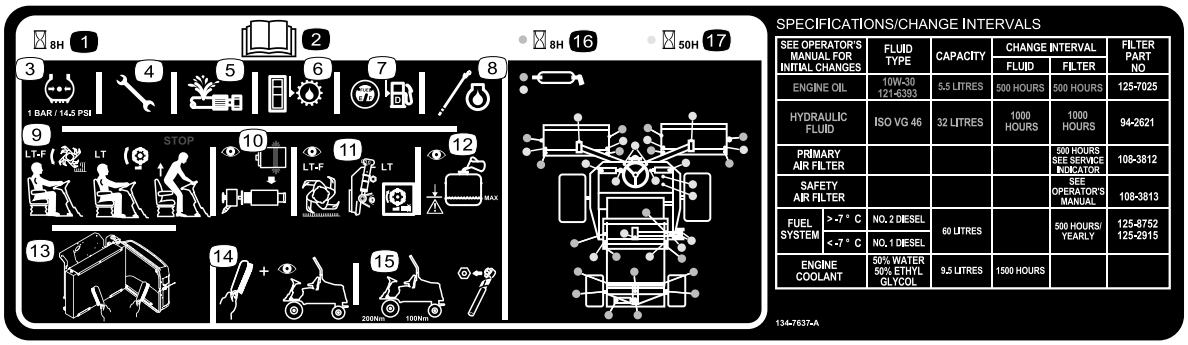


decal134-4280

134-4280

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

1. Warning—read the *Operator's Manual*; wear hearing protection; remove the key before performing maintenance.
2. Thrown object hazard—keep bystanders away.
3. Tipping hazard—lower the cutting units when driving downhill; drive slowly when turning; do not turn sharply while traveling fast; do not operate on slopes greater than 20º.



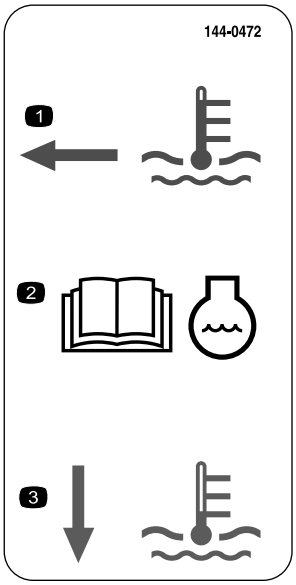
SPECIFICATIONS/CHANGE INTERVALS

SEE OPERATOR'S MANUAL FOR INITIAL CHANGES	FLUID TYPE	CAPACITY	CHANGE INTERVAL		FILTER PART NO
			FLUID	FILTER	
ENGINE OIL	10W-30 121-6393	5,5 LITRES	500 HOURS	500 HOURS	125-7025
HYDRAULIC FLUID	ISO VG 46	32 LITRES	1000 HOURS	1000 HOURS	94-2621
PRIMARY AIR FILTER				500 HOURS SEE SERVICE INDICATOR	108-3812
SAFETY AIR FILTER				SEE OPERATOR'S MANUAL	108-3813
FUEL SYSTEM >-7° C	NO. 2 DIESEL	60 LITRES		500 HOURS/ YEARLY	125-8752 125-2915
FUEL SYSTEM <-7° C	NO. 1 DIESEL				
ENGINE COOLANT	50% WATER 50% ETHYL GLYCOL	9,5 LITRES	1500 HOURS		

decal134-7637

134-7637

1. 8 hour service interval
2. Read the *Operator's Manual*.
3. Check the tire pressure.
4. Check all bolts and nuts for proper tightness.
5. Check all hoses for leaks.
6. Check the hydraulic-oil level.
7. Check the fuel level.
8. Check the engine-oil level.
9. Check the operation of the seat switch.
10. Check the air filter element.
11. Check the cutting unit settings.
12. Check the engine-coolant level.
13. Check the cleanliness of the radiator.
14. Clean and inspect the machine.
15. Check the wheel nut tightness using a torque wrench, front wheels 200 N•m, rear wheels 100 N•m.
16. 8 hour service interval
17. 50 hour service interval



decal144-0472

144-0472

1. The coolant level is hot.
2. Read the *Operator's Manual* for coolant information.
3. The coolant level is cold.

Setup

Media and Additional Parts

Description	Qty.	Use
Operator's Manual Engine owner’s manual	1 1	Read the manuals before operating the machine.
CE certificate	1	The certificate indicates CE compliance.

Store all documentation in a safe place for future use.

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

Product Overview

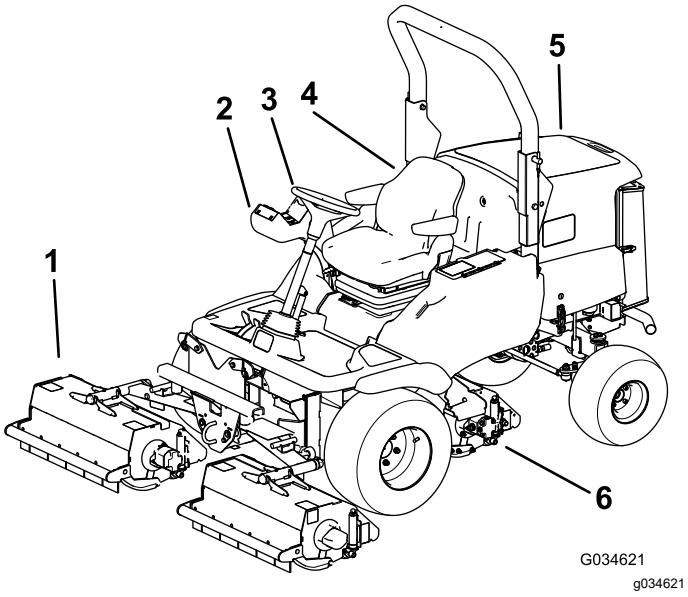


Figure 3

1. Front cutting units
2. Control arm
3. Steering wheel
4. Operator's seat
5. Engine hood
6. Rear cutting unit

Controls

Control Panel Components

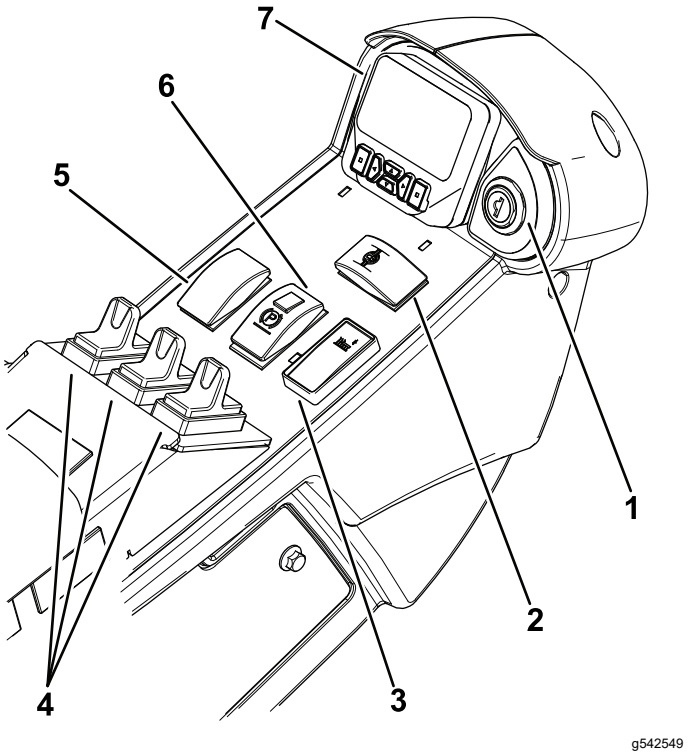
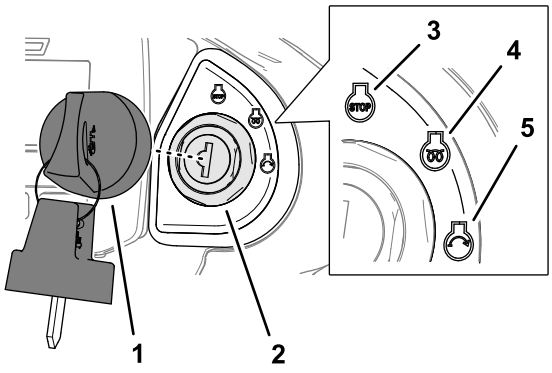


Figure 4

1. Key switch
2. Differential-lock switch (optional kit)
3. Cutting-unit-drive switch
4. Lift-control switches
5. Engine-speed switch
6. Parking-brake switch
7. InfoCenter display

Key Switch

Use the key switch to control the engine and power to certain electrical components.



g290335

Figure 5

1. Key
2. Key switch
3. Shutoff position (stop)
4. Intake heater/run position
5. Start position

Cutting-Unit-Drive Switch

Use the cutting unit drive to run or shut off the cutting units (Figure 4).

Note: Always put the cutting-unit-drive switch in the OFF position when driving the machine between job sites.

Lift-Control Switches

Use the lift-control switches to raise and lower the cutting units (Figure 4).

Engine-Speed Switch

Use the engine-speed switch to control the speed of the engine.

The engine-speed switch (Figure 4) has 2 modes to change the engine speed.

Momentarily tap the switch to change the engine speed by 100 rpm increments.

Press and hold the switch forward to change the engine to HIGH-IDLE.

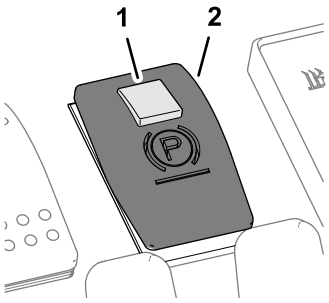
Press and hold the switch rearward to change the engine to LOW-IDLE.

Parking-Brake Switch

⚠ WARNING

The parking brake affects the front wheels only, and may not keep the machine from rolling down a slope. The machine could move unintentionally.

Do not park the machine on a slope.



g289697

Figure 6

1. Locking button
2. Parking-brake switch

- To engage the parking brake, slide the small locking button on the top of the switch back and press the switch forward (Figure 6).

  Note: The parking brake icon displays in the InfoCenter.
- To disengage the parking brake, press the switch back.

Service Brake

The hydraulic transmission provides the machine with service-brake effect. When you release the forward or reverse travel pedals or reduce engine speed, the transmission produces service-brake effect and ground speed slows or stops the machine. To increase the transmission-braking effect, push the transmission pedal into the NEUTRAL position. Only the front wheels provide service brake effect.

⚠ DANGER

The service braking system does not keep the machine from rolling when parked. The machine could move unintentionally.

Engage the parking brake when you park the machine.

Emergency Brake

If the service brake is damaged or ineffective, shut off the engine, engage the parking brake remove the key, and have the machine repaired.

Traction Pedals

Forward travel: Press the forward traction pedal to drive the machine forward and increase ground speed. Release the pedal to reduce ground speed (Figure 7).

Reverse travel: Press the reverse traction pedal to drive the machine backward and increase ground speed. Release the pedal to reduce ground speed (Figure 7).

Stop (Neutral): To stop the machine, use 1 of the following procedures:

- Reduce your foot pressure on the traction pedal and allow it to return to the neutral position. The machine dynamically brakes to a smooth stop.
- Tap or hold the reverse pedal briefly. This stops the machine faster than dynamic braking.

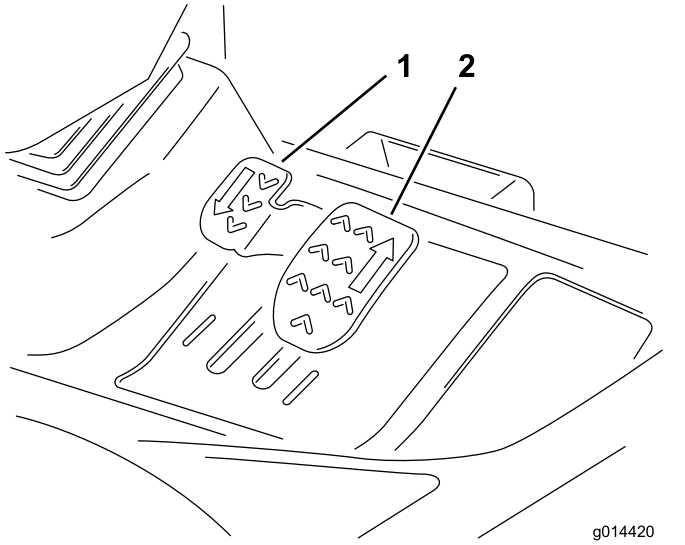


Figure 7

1. Reverse traction pedal
2. Forward traction pedal

Adjustable Steering Column

Adjust the steering wheel and column only when the machine is parked on level ground.

1. To tilt the steering wheel, press the foot pedal down.
2. Position the steering tower to the most comfortable position and release the pedal (Figure 8).



Figure 8

Operator's Seat Controls

Forward/Backward Adjustment

Move the lever upward to adjust the forward/backward position of the seat. Release the lever to lock the seat in position (Figure 9).

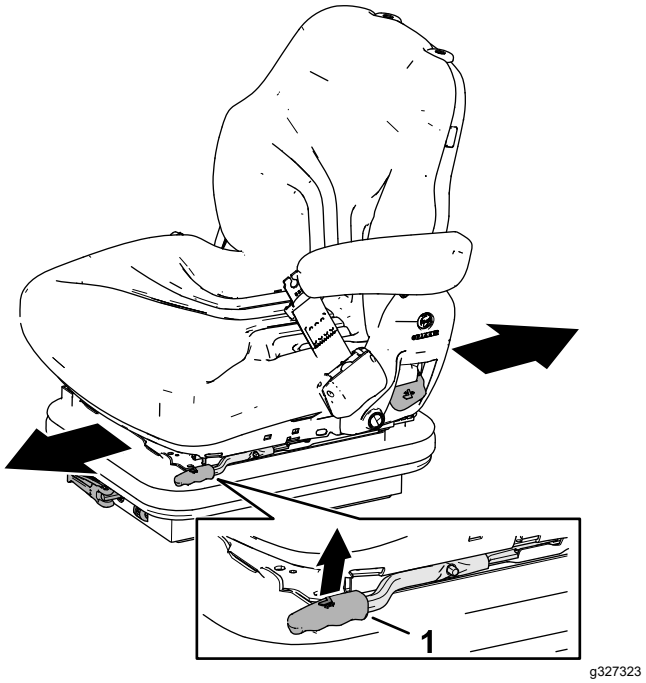


Figure 9

1. Lever

Operator Weight Adjustment

Rotate the handle clockwise to increase suspension stiffness and counterclockwise to decrease the stiffness. The dial indicates when the seat suspension is adjusted for the operator's weight (kg); refer to Figure 10.

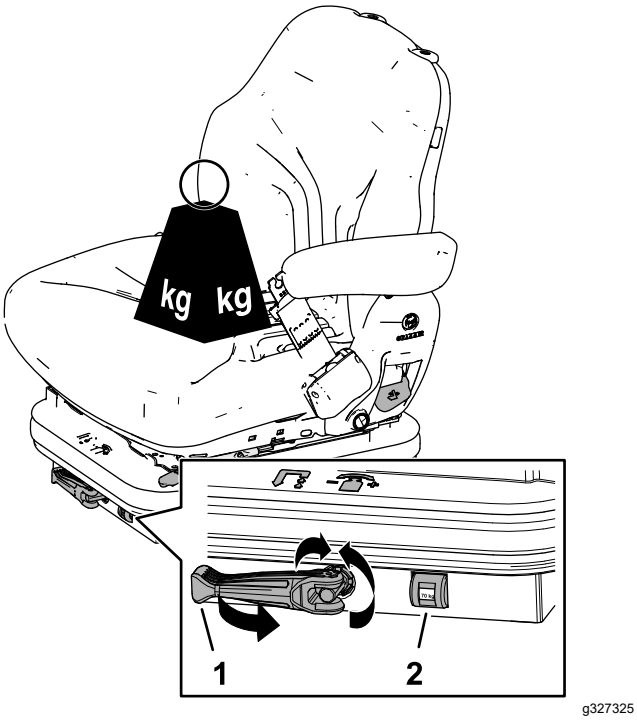


Figure 10

1. Lever
2. Dial

Height Adjustment

To adjust seat height incremental, manually lift the seat. To lower the seat, lift it beyond the highest setting, allow it to drop to the lowest setting, and if needed manually lift the seat to the desired height (Figure 11).

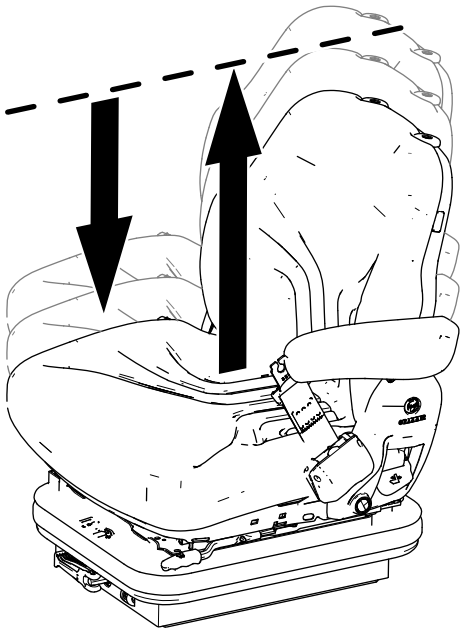


Figure 11

1. Handle

Backrest Adjustment

Pull the handle outward to adjust the seat backrest angle. Release the handle to lock the seat backrest in position (Figure 12).

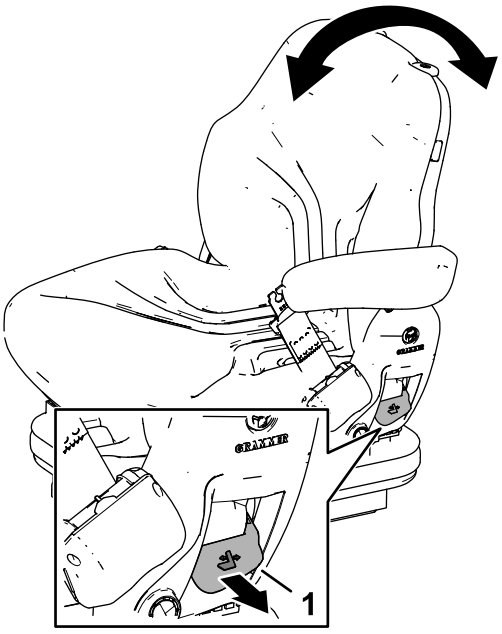
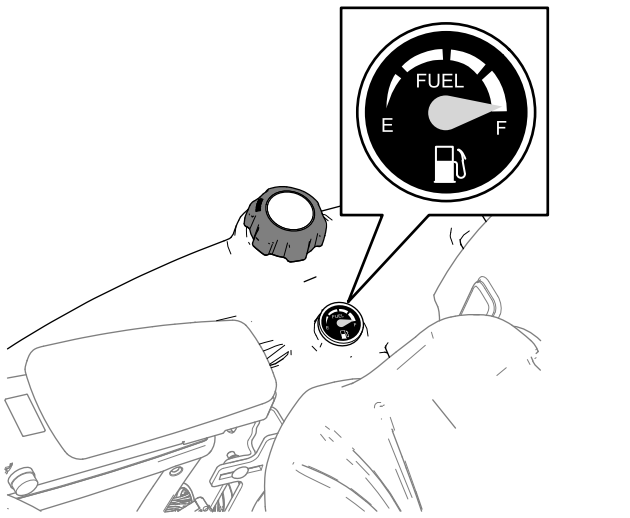


Figure 12

1. Handle

Fuel Gauge

The fuel gauge shows the amount of fuel in the tank (Figure 13).



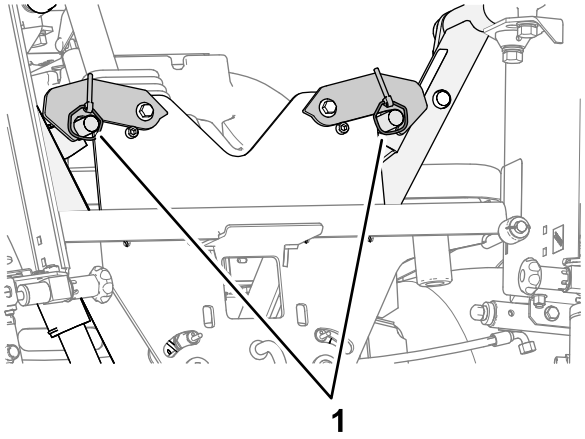
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Figure 13

Transport Latches

Front Cutting Unit Arm Latches

Raise the cutting units to the TRANSPORT position and secure the arm-latch pins to the latches with the bails (Figure 14).



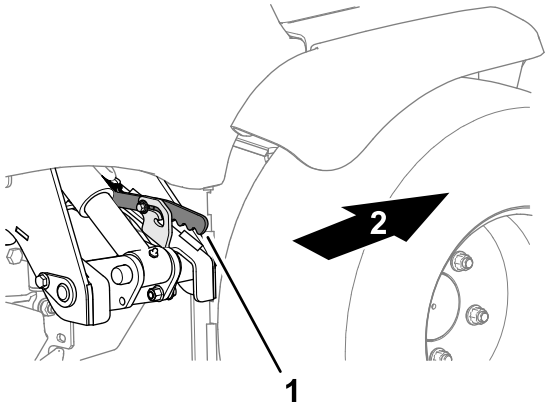
g327358

Figure 14

1. Bails (front cutting-unit arm latches)

Rear Cutting Unit Arm Latch

Raise the cutting units to the TRANSPORT position, lift the latch arm for the rear cutting-unit arm, and position the arm inboard (Figure 15).



g327359

Figure 15

1. Latch arm (rear cutting-unit arm latch)
2. Front of the machine

Specifications

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

Specification	LT-F3000
Transport Width	157.5 cm (62 inches)
Width of cut	76 cm (30 inches) to 212 cm (83.5 inches)
Height of cut	20 mm (3/4 inch) to 75 mm (3 inches)
Length	300 cm (118.1 inches)
Height	168 cm (66.2 inches) with the ROPS down
	216 cm (85.0 inches) with ROPS up
	209 cm (82.3 inches) with cab
Weight (without fuel or accessories)	1,436 kg (3,166 lb) with ROPS
	1,636 kg (3,607 lb) with cab
Engine	Yanmar 3TNV86CT 32.4 kw (43.4 hp) at 3,000 rpm
Fuel tank capacity	60 L (15.9 US gallons)
Transport speed	25 km/h (15.5 mph)
Mowing speed	11 km/h (6.85 mph)
Hydraulic system capacity	32 L (8.5 US gallons)
Engine speed	3000 rpm
Rotor speed	3000 rpm

Attachments/Accessories

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

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

Operation

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.
- Before you leave the operator's position, do the following:
  - Park the machine on a level surface.
  - Disengage and lower the cutting units.
  - Engage the parking brake.
  - Shut off the engine and remove the key.
  - Wait for all movement to stop.
  - Allow the machine to cool before adjusting, servicing, cleaning, or storing it.
- Know how to stop the machine and shut off the engine quickly.
- Do not operate the machine without all guards and other safety protective devices in place and functioning properly on the machine.
- Before mowing, always inspect the machine to ensure that the cutting units are in good working condition.
- Inspect the area where you will use the machine and remove all objects that the machine could throw.
- This product generates an electromagnetic field. If you wear an implantable electronic medical device, consult your health care professional before using this product.

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.
- Do not remove the fuel cap or fill the fuel tank while the engine is running or hot.
- Do not add or drain fuel in an enclosed space.
- Do not store the machine or fuel container where there is an open flame, spark, or pilot light, such as on a water heater or 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.

Performing Daily Maintenance

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

Filling the Fuel Tank

Fuel Tank Capacity

60 L (15.9 US gallons)

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 for more information on biodiesel.

Adding Fuel

1. Park the machine on a level surface, lower the cutting units, shut off the engine, engage the parking brake, and remove the key.

2. Using a clean rag, clean area around fuel-tank cap.
3. Remove the cap from the fuel tank (Figure 16).

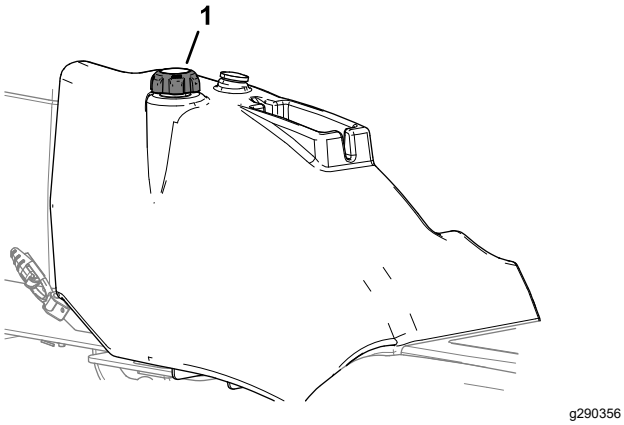


Figure 16

1. Fuel-tank cap

4. Fill the tank until the level is 25 mm (1 inch) below the bottom of the filler neck.
5. Install the fuel-tank cap tightly after filling the tank.

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

Checking the Forward/Reverse Traction Pedal Action

Service Interval: Before each use or daily

With the engine shut off, operate the forward and reverse traction pedals through the full range of articulation and ensure that the mechanism returns freely to the NEUTRAL position.

Checking the Interlock Switches

Service Interval: Before each use or daily—Check the interlock switches: operator presence, cutting-unit drive interlock, parking brake interlock, and transmission neutral interlock.

Checking the Operator Presence Seat Switch

1. Sit on the operator's seat and start the engine.
2. Lower the cutting units to the ground.
3. Set the cutting-unit-drive switch to the cut position.
4. Rise from the operator's seat and check that the cutting units stop after an initial 0.5 to 1 second delay.

Checking the Cutting-Unit Drive Interlock Switch

1. Shut off the engine.
2. Set the cutting-unit-drive switch to the OFF position and turn the ignition key to the START position. The engine should start.
3. Set the cutting-unit-drive switch to the cut position and turn the ignition key to the START position. The engine should not start.

Checking the Parking Brake Interlock Switch

1. Shut off the engine.
2. Engage the parking brake.
3. Rotate the ignition key to the preheat-run position. The parking-brake switch illuminates and the parking brake icon displays in the InfoCenter.
4. Disengage the parking brake; the parking brake light and icon shut off. The engine should not start when you rotate the ignition key to the START position.
5. Engage the parking brake, sit on the operator's seat, and start the engine.
6. Disengage the parking brake.
7. Rise from the operator seat's and check that the engine shuts off.

Checking the Transmission Neutral Interlock Switch

Important: **Take extreme care to ensure that the area around the machine is clear before checking that the engine does not start when checking the neutral interlock switch.**

1. Shut off the engine.
2. Remove your foot from the forward/reverse travel pedals.
3. Turn the ignition key to preheat-run position .

   The transmission neutral icon N displays in the InfoCenter.
4. Apply light pressure to the travel pedals in a forward and reverse direction to check that the transmission neutral icon is not displayed in the InfoCenter.

Overview of the InfoCenter Display

The display shows information about your machine such as the operating status, various diagnostics and other information about the machine. There are multiple screens on the display. You can switch between the screens, at any time, by pressing the back button and then using the up and down directional buttons.

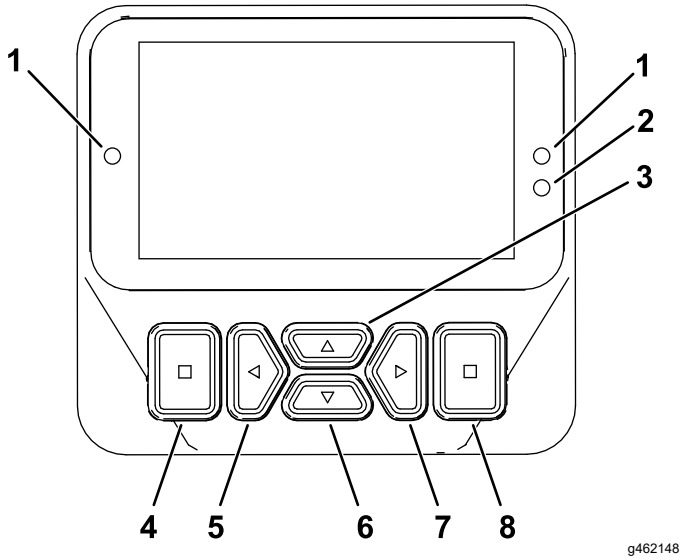
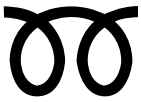
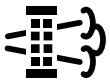
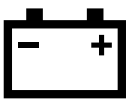


Figure 17

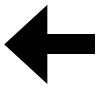
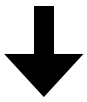
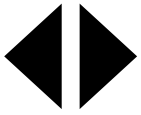
1.	Indicator light	5.	Navigation button— decrease/ left
2.	Display brightness sensor	6.	Navigation button— down
3.	Navigation button— up	7.	Navigation button— increase/ right
4.	Back button	8.	Enter button

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 Display Icons

	Hour meter
	Service is due.
	The glow plugs are active.
	The operator must sit in the seat.
	The parking brake is engaged.
	Engine coolant temperature (°C or °F)
	Start the engine.
	Engine
	A parked or recovery regeneration is requested. Perform the regeneration immediately.
	A regeneration is acknowledged and the request is processing.
	A regeneration is in progress and the exhaust temperature is elevated.
	NOx control system malfunction; the machine requires service.
	The power take-off is disabled.
	The PTO is engaged.
	Battery voltage

InfoCenter Display Icons (cont'd.)

	Warning
	Active
	Inactive
	Previous
	Next
	Increase
	Decrease
	Previous screen
	Next screen
	Increase value
	Decrease value
	Menu
	Scroll up/down
	Scroll left/right
	Locked

Overview of the Menus

To access the InfoCenter display menu system, press the back 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.

🔒 Protected under Protected Menus—accessible only by entering PIN

Main Menu

Menu Item	Description
Faults	The Faults menu contains a list of the recent machine faults. Refer to the *Service Manual* or contact 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, counters, and other similar numbers.
Diagnostics	The Diagnostics menu displays the state of each machine switch, sensor, and control output. You can use this to troubleshoot certain issues as it quickly tells you which machine controls are on and which are off.
Settings	The Settings menu allows you to customize and modify configuration variables on the display.
Machine Settings	The Machine Settings menu allows you to adjust the limited lift in reverse and turnaround settings.
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 PTO have been on, as well as the number of hours the machine has been transported and service due.
Counts	Lists numerous counts the machine has experienced.
DPF Regeneration	The diesel particulate filter regeneration option and DPF submenus

Diagnostics

Menu Item	Description
Traction	Indicates the inputs and outputs for the traction pedal.
Raise	Indicates the inputs, qualifiers, and outputs for raising the cutting units.
Lower	Indicates the inputs, qualifiers, and outputs for lowering the cutting units.
PTO	Indicates the inputs, qualifiers, and outputs for enabling the PTO circuit.
Engine	Indicates the inputs, qualifiers, and outputs for starting the engine.

Settings

Menu Item	Description
Enter PIN	Allows a person (superintendent/mechanic) authorized by your company with the PIN code to access protected menus.
Backlight	Controls the brightness of the LCD display.
Language	Controls the language used on the display.
Units	Controls the units used on the InfoCenter (English or Metric).
Protected Menus 🔒	Allows a person authorized by your company with the PIN code to access protected menus
Protect Settings 🔒	Allows the ability to change the settings in the protected settings.

Machine Settings

Menu Item	Description
Limited Lift Reverse	Turns limited lift on or off when in reverse.
Turnaround	Turns turnaround mode on or off.
Slope Sensor Installed	Indicates a slope sensor is detected on the machine.

🔒 Protected under Protected Menus—accessible only by entering PIN

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.
S/W Revision	Lists the software revision of the primary controller.
InfoCenter Revision 🔒	Lists the software revision of the InfoCenter
CAN Statistics 🔒	Indicates the inputs and outputs for the CAN.

Accessing Run Screens

1. From the MAIN MENU, press the left navigation button to access the MAIN RUN SCREEN displaying the coolant temperature, interlock status, and cutting unit position.
2. Press the right navigation button to scroll to the SECONDARY RUN SCREEN displaying the hours, battery voltage, and RPMs.

Protected Menus

There are operating configuration settings that are adjustable within SETTINGS of the display. To lock these settings, use the PROTECTED MENU.

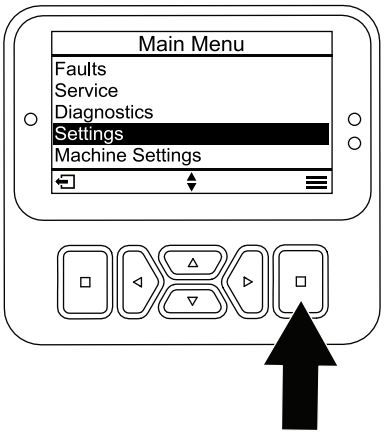
Note: At the time of delivery, the initial password code is programmed by your distributor.

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.

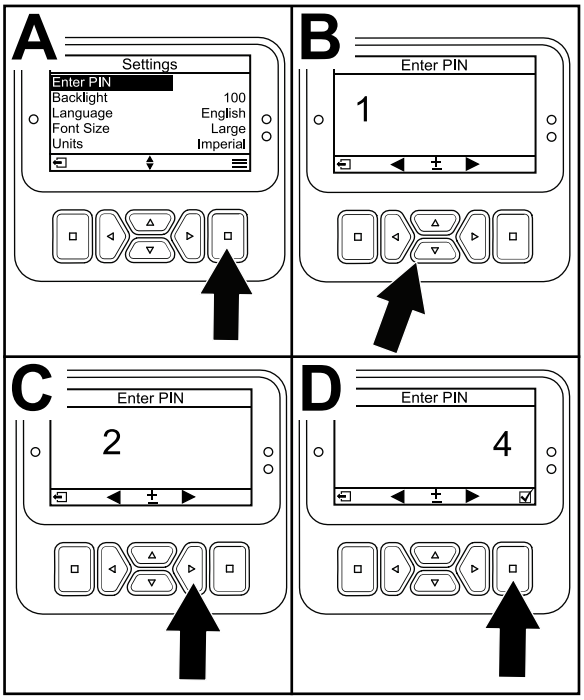
1. From the MAIN MENU, scroll down to SETTINGS and press the select button (Figure 18).



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Figure 18

2. In SETTINGS, scroll to ENTER PIN and press the select button (Figure 19A).



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Figure 19

3. To enter the PIN code, press the up/down navigation buttons until the correct first digit appears, then press the right navigation button to move on to the next digit (Figure 19B and Figure 19C). Repeat this step until the last digit is entered.
4. Press the select button.

   Note: If the display accepts the PIN code and the protected menu is unlocked, the word “PIN” displays in the upper right corner of the screen.
5. To lock the protected menu, rotate the key switch to the OFF position and then to the ON position.

Viewing and Changing the Protected Menu Settings

1. In SETTINGS, scroll down to PROTECT SETTINGS.
2. To view and change the settings without entering a PIN code, use the select button to change the PROTECT SETTINGS to ☐ (Off).
3. To view and change the settings with a PIN code, use the select button to change the PROTECT SETTINGS to ☑ (On), set the PIN code, and turn the key in the ignition switch to the OFF position and then to the ON position.

Setting the Service Due Timer

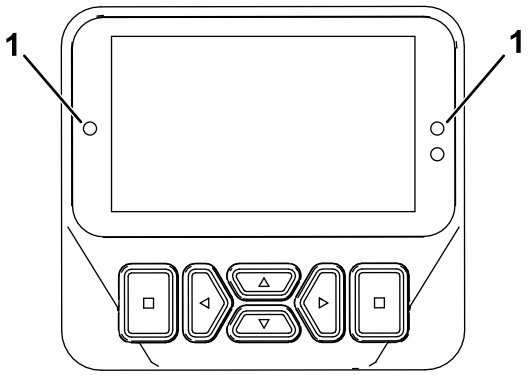
The service due timer resets the service due hours after a scheduled maintenance procedure is performed.

1. In SETTINGS, scroll to ENTER PIN and press the select button.
2. Enter PIN; refer to Accessing Protected Menus (page 23).
3. In SERVICE, navigate to HOURS and press the select button.
4. Scroll down to SERVICE DUE.

   Note: If service is currently due, NOW appears next to SERVICE DUE.
5. Highlight the service interval and press the select button.

   Note: The service interval (250 Hrs, 500 Hrs, etc.) is located next to SERVICE DUE. Service interval is a protected menu item.
6. When the RESET SERVICE TIMER? screen appears, press the select button for YES or the back button for NO.
7. After you select YES, the interval screen clears and reverts back to the service hours selections.

Understanding the Diagnostic Light



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Figure 20

1. Diagnostic light

- Flashing red—active fault
- Solid red—active advisory
- Solid blue—calibration/dialog messages
- Lights off—normal operation

During Operation

During Operation Safety

General Safety

- The owner/operator can prevent and is responsible for accidents that may cause personal injury or property damage.
- Wear appropriate clothing, including eye protection; long trousers; substantial, slip-resistant footwear; and hearing protection. Tie back long hair and do not wear loose clothing or loose jewelry.
- Do not operate the machine while ill, tired, or under the influence of alcohol or drugs.
- Use your full attention while operating the machine. Do not engage in any activity that causes distractions; otherwise, injury or property damage may occur.
- Before you start the engine, ensure that all drives are in neutral, the parking brake is engaged, and you are in the operating position.
- Do not carry passengers on the machine and keep bystanders and children out of the operating area.
- 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.

- Keep your hands and feet away from the cutting units.
- 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.
- Stop the cutting units whenever you are not mowing.
- Slow down and use caution when making turns and crossing roads and sidewalks with the machine. Always yield the right-of-way.
- Operate the engine only in well-ventilated areas. Exhaust gases contain carbon monoxide, which is lethal if inhaled.
- Do not leave a running machine unattended.
- Before you leave the operator's position, do the following:
  - Park the machine on a level surface.
  - Disengage and lower the cutting units.
  - Engage the parking brake.
  - Shut off the engine and remove the key.
  - Wait for all movement to stop.
  - Allow the machine to cool before adjusting, servicing, cleaning, or storing it.
- Operate the machine only in good visibility and appropriate weather conditions. Do not operate the machine when there is the risk of lightning.
- Use the cruise control (if equipped) only when you can operate the machine in an open, flat area that is free from obstacles and where the machine can move at a constant speed without interruption.

Rollover Protection System (ROPS) Safety

- Do not remove any of the ROPS components from the machine.
- Ensure that the seat belt is attached and that you can release it quickly in an emergency.
- Always wear your seat belt.
- 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 all damaged ROPS components. Do not repair or alter them.

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

- Slopes are a major factor related to loss of control and rollover accidents, which can result in severe injury or death. You are responsible for safe slope operation. Operating the machine on any slope requires extra caution.
- Evaluate the site conditions to determine if the slope is safe for machine operation, including surveying the site. Always use common sense and good judgment when performing this survey.
- Review the slope instructions, listed below, for operating the machine on slopes. Before you operate the machine, review the site conditions to determine whether you can operate the machine in the conditions on that day and at that site. Changes in the terrain can result in a change in slope operation for the machine.
  - Avoid starting, stopping, or turning the machine on slopes. Avoid making sudden changes in speed or direction. Make turns slowly and gradually.
  - Do not operate a machine under any conditions where traction, steering, or stability is in question.
  - Remove or mark obstructions such as ditches, holes, ruts, bumps, rocks, or other hidden hazards. Tall grass can hide obstructions. Uneven terrain could overturn the machine.
  - Be aware that operating the machine on wet grass, across slopes, or downhill may cause the machine to lose traction.
  - Use extreme caution when operating the machine near drop-offs, ditches, embankments, water hazards, or other hazards. The machine could suddenly roll over if a wheel goes over the edge or the edge caves in. Establish a safety area between the machine and any hazard.
  - Identify hazards at the base of the slope. If there are hazards, mow the slope with a pedestrian-controlled machine.

– If possible, keep the cutting units lowered to the ground while operating on slopes. Raising the cutting units while operating on slopes can cause the machine to become unstable.

Understanding the Operator Presence Controls

⚠ CAUTION

If 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.**

Important: **Do not operate the machine if the operator presence controls are damaged or worn. Always replace damaged or worn parts, and check that operator presence controls function correctly before operating the machine.**

Engine Start Interlock

You can start the engine only when the forward/reverse travel pedal is in the NEUTRAL position, the cutting-unit-drive switch is in the OFF position, and the parking brake is engaged.

Note: You can start the engine only when the cutting-unit-drive switch is in the OFF position.

Engine Run Interlock

Once you start the engine, you must sit in the operator's seat to run the engine while the parking brake is disengaged.

The engine shuts off if you leave the operator's seat without first engaging the parking brake.

Cutting Unit Drive Interlock

You must sit in the operator's seat to run the cutting units. If you raise off the seat for more than a second, a switch activates and the drive to the cutting units disengages.

To reset the cutting units, sit in the seat, move the cutting-unit-drive switch to the OFF position, and then move the switch to the ON position.

Note: If you briefly raise off the seat during normal work, drive to the cutting units is not affected.

Adjusting the Roll Bar

⚠ 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 seat is secured with the seat latch.

⚠ WARNING

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

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

Important: **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 Roll Bar

1. Park the machine on a level surface, lower the cutting units, engage the parking brake, shut off the engine, and remove the key.
2. Remove the hairpins from the roll-bar pins in the pivot brackets of the lower roll-bar frame (Figure 21).

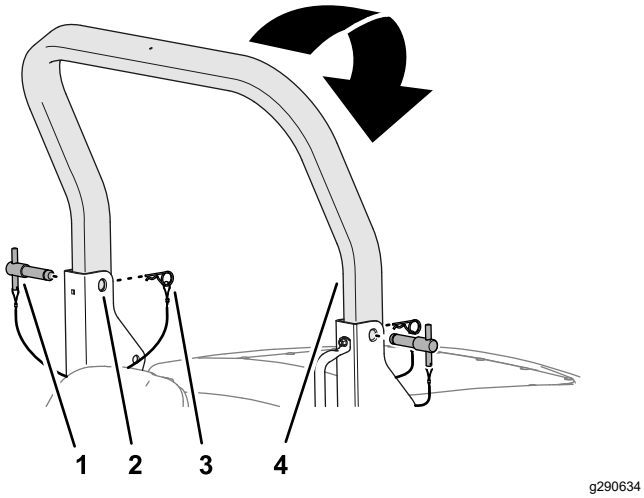


Figure 21

1. Roll-bar pin
2. Pivot bracket upper (lower roll-bar frame)
3. Hairpin
4. Upper roll bar

3. While supporting the weight of the upper roll bar, remove the roll-bar pins from the pivot brackets (Figure 21).
4. Carefully lower the upper roll bar until it rests on the stops of the lower roll-bar frame.
5. Insert the roll-bar pins in the lower holes of the pivot brackets (Figure 22).

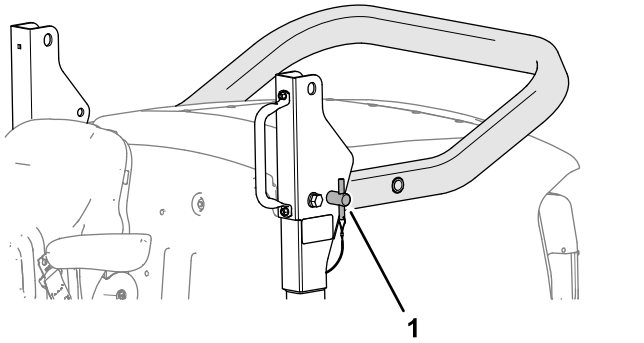


Figure 22

1. Roll-bar pin (lower position)

6. Secure roll-bar pins to the pivot brackets with the hairpins.

Raising the Roll Bar

1. Remove the hairpins that secure the roll-bar pins to the pivot brackets of the lower roll-bar frame.
2. Remove the roll-bar pins to the pivot brackets (Figure 23).

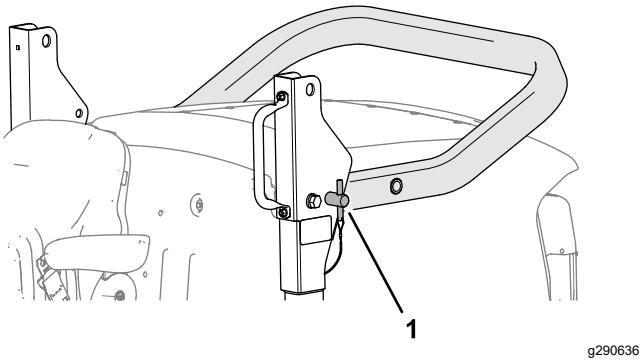


Figure 23

1. Roll-bar pin

3. Raise the upper roll bar until the holes in the roll bar align with the pivot brackets (Figure 24).

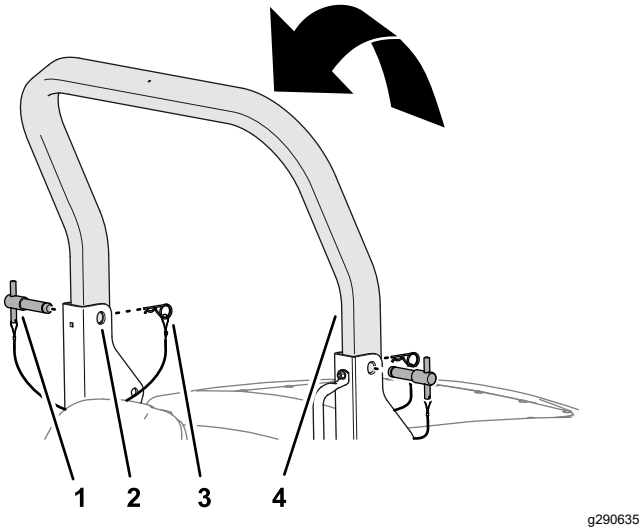


Figure 24

1. Roll-bar pin
2. Pivot bracket upper hole (lower roll-bar frame)
3. Hairpin
4. Upper roll bar

4. Insert the roll-bar pins through the upper holes of the pivot brackets and the upper roll bar (Figure 24).
5. Secure roll-bar pins to the pivot brackets with the hairpins (Figure 24).

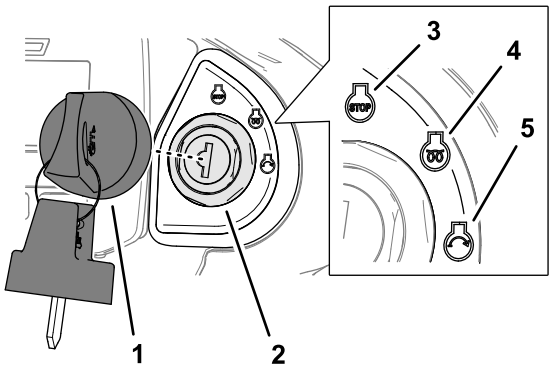
Starting the Engine

Important: **If you are starting the engine for the first time, the engine has stopped from lack of fuel, or you performed fuel system maintenance, bleed the fuel system before starting the engine; refer to Priming the Fuel System (page 49).**

Important: **This machine is fitted with an engine start lockout; refer to Understanding the Operator Presence Controls (page 26).**

1. Engage the parking brake, move the traction pedal to the NEUTRAL position, and ensure that the cutting unit drive switch is in the OFF position.
2. Turn the key to the INTAKE HEATER/RUN POSITION position.

   Note: The pre-heat indicator icon displays in the InfoCenter. Wait until the pre-heat indicator icon no longer displays.



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Figure 25

1. Key
2. Key switch
3. Shutoff position (stop)
4. Intake heater/run position
5. Start position

3. Rotate the key to the start position.

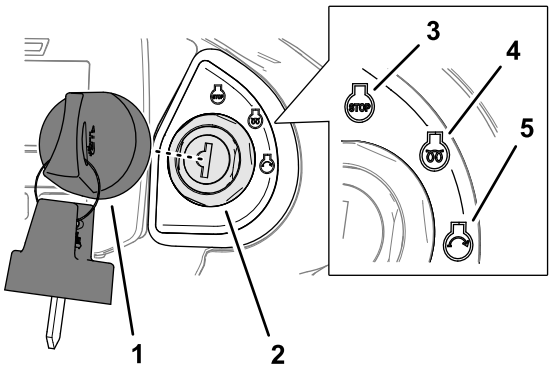
   When the engine starts, release the key to the intake heater/run position.

   Important: **Crank the engine for no longer than 15 seconds.**
4. Run the engine at low idle speed until it warms up.

Shutting Off the Engine

Important: **Allow the engine to idle for 5 minutes before shutting it off after a full-load operation. This allows the turbocharger to cool down before shutting off the engine. Failure to idle the engine may damage the turbocharger.**

1. Move the traction pedal to the NEUTRAL position, shut off the cutting unit drive switch, engage the parking brake, and lower the cutting units.
2. Press the engine speed switch until the engine speed is at low idle.
3. Let the engine run for at least 5 minutes.
4. Turn the key to shutoff (stop) position (Figure 26).



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Figure 26

1. Key
2. Key switch
3. Shutoff position (stop)
4. Intake heater/run position
5. Start position

5. Remove the key before you leave the operator's seat.

Flail Cutting Unit General Information

It is important to keep the flail blades sharp and in good condition to ensure good cutting performance, minimum power consumption, and a good quality of cut.

The flail head is a fine cut flail and should only be used for maintaining grass. Its recommended that a maximum of 1/3 of the total grass length is removed when cut.

The scraper wires are fitted to remove debris from the roller, in dry conditions these may not be required and its recommended they are removed. In damp wet conditions ensure that scraper wires do not get plugged with debris.

The cutting unit floats and can pivot laterally to follow ground contours.

The cutting units are designed to be operated at full engine rpm. Forward speed should be adjusted depending on grass conditions and to not overload the power units or the heads. The lower the forward speed the higher the quality of cut and after cut appearance.

Adjusting the Height of Cut

Note: The height of cut is gauged by the rear roller. Blade wear, worn cutting unit pivots, bent/damaged cutting unit pins, and bent/damaged arms can affect the height-of-cut setting.

1. Turn the adjusting-nut assembly on both ends clockwise to decrease the height of cut or counter-clockwise to increase the height of cut (Figure 27).

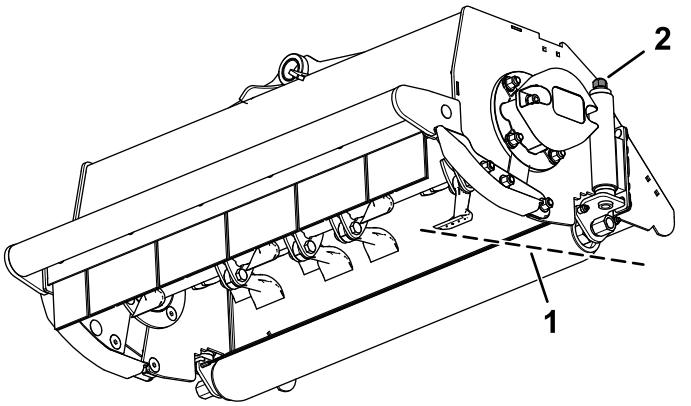


Figure 27

1. Height of cut
2. Adjusting-nut assembly

Important: **Do not attempt to unlock the nut assemblies.**

2. Ensure that all cutting units are set at the same height of cut by referring to the indicator rings (Figure 28).

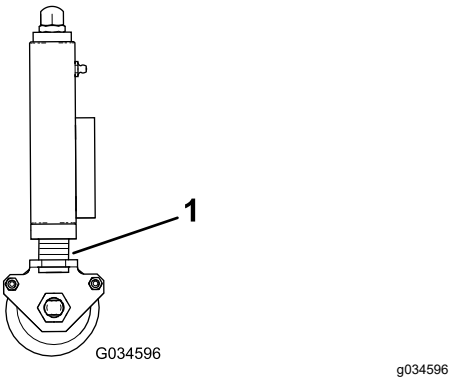


Figure 28

1. Indicator rings

Note: Refer to Figure 29 for the height-of-cut settings.

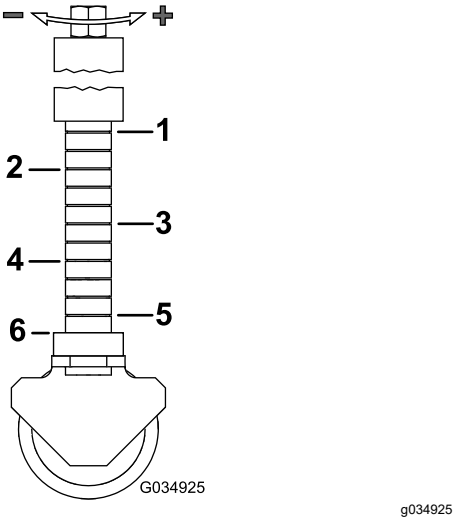


Figure 29

1. 75 mm (3.0 inches)
2. 65 mm (2.5 inches)
3. 50 mm (2.0 inches)
4. 40 mm (1.5 inches)
5. 25 mm (1.0 inches)
6. 20 mm (0.75 inches)

Controlling the Position of the Individual Cutting Units

Use the 3 lift-control switches to raise or lower the cutting units independently.

Lowering the Cutting Unit

1. Press the cutting-unit-drive switch to the cut position.
2. Press the lift-control switch forward and release.

   Note: The cutting unit engages when it is approximately 150 mm (6 inches) above ground level. The cutting unit is in 'float' mode, and follows the ground contours.

   Note: The lift-control switch automatically returns to the (NEUTRAL) position when you release it.

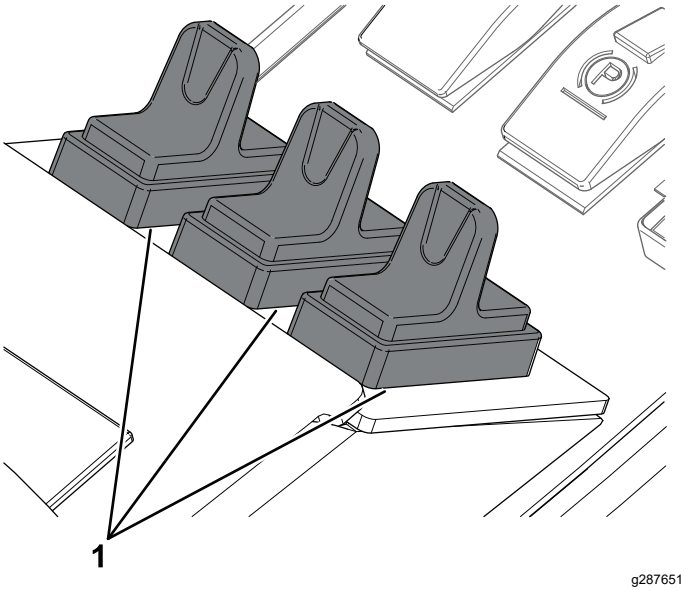


Figure 30

1. Lift-control switches

Raising the Cutting Unit

1. Pull and hold the lift-control switch.
2. Release the lift-control switches when the cutting units are at the needed height.

Note: The lift-control switches automatically return to the (NEUTRAL) position when you release it and the cutting unit arms hydraulically lock into position.

Cutting Unit Limited-Lift Position

Limiting Cutting Unit Lift When Driving Forward

Note: The limited lift function for driving forward is enabled by default.

- While driving forward, momentarily pull the lift-control switch(s).

  Note: The cutting unit(s) shuts off and it raises approximately 150 mm (6 inches) above ground level.
- The limited lift function shuts off when the cutting unit is lowered and running.

Limiting Cutting Unit Lift When Driving Backward

Note: You must enable the limited-lift function in the InfoCenter to automatically lift the cutting units when driving backward.

- When the limited-lift function is enabled, driving the machine backward causes all cutting units raise to the limited-lift position.

  Note: The cutting unit(s) raises approximately 150 mm (6 inches) above ground level.

  Important: **The cutting units continue to run while using limited lift and driving the machine backward.**
- Driving the machine forward again causes the cutting unit lower to the float position.

Using the Cutting-Unit Turnaround Feature

Note: You must enable the turnaround feature for the center lift-control switch in the settings menu of the InfoCenter.

- Momentarily pull the lift-control switch for the center cutting unit to raise all cutting units to the limited lift position.
- Momentarily push down the lift-control switch for the center cutting unit to lower all cutting units to the float position.

Adjusting the Cutting Unit Auto-Limited Lift

Note: You enable the cutting-unit Auto Limited Lift feature in the settings menu of the InfoCenter.

- Manual limited lift uses the 3 lift-control switches, and is always available regardless of auto-limited lift setting in the InfoCenter.

- When cutting-unit Auto Limited Lift is enabled, driving the machine in reverse causes the cutting units to automatically raise to the limited-lift position.
- The cutting units return to the floating position when driving the machine forward.

To raise the cutting units to the limited-lift position, momentarily pull the lift-control switches.

Note: The cutting-unit drives disengage immediately, and the cutting units raise to approximately 150 mm (6 inches) above ground level.

Auto-limited lift operates with the cutting units lowered and rotating.

Engaging the Cutting Unit Drive

The cutting unit drive engages only when you sit in the operator's seat; refer to Checking the Operator Presence Seat Switch (page 19).

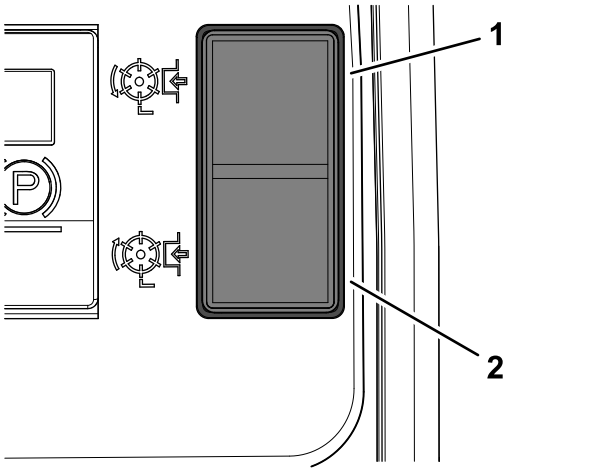


Figure 31

1. ON position
2. OFF position

Engaging the Cutting Unit Drive

Press the top of the cutting unit drive switch to the ON position (Figure 31).

Disengaging All Cutting Unit Drives

Press the cutting unit drive switch to the OFF position (Figure 31).

Lowering the Cutting Units

The cutting unit drive switch must be set to the ON position (Figure 31). Operate the lift-control switch(s) in a downward direction. The cutting units run when the cutting units are approximately 150 mm (6 inches) above ground level.

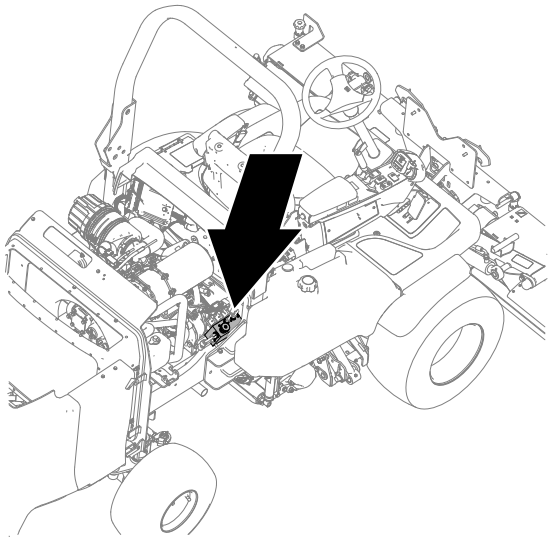
Adjusting the Weight Transfer/Traction Assistance

A variable hydraulic weight transfer system provides improved tire grip with the grass surface—traction assistance.

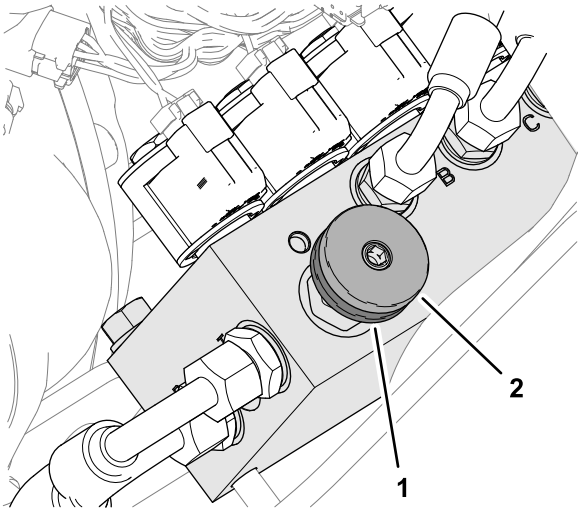
Hydraulic pressure from the cutting-unit lift system provides a lifting force that reduces the weight of the cutting units on the ground and transfers the weight downward to the tires. This action is known as weight transfer.

Note: Adjust the amount of weight transfer to suit operating conditions.

1. Open the hood.



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Figure 32

1. Lock wheel
2. Weight transfer hand wheel

2. At the right side of the machine, loosen the lock wheel of the weight transfer manifold 1/2 turn counterclockwise while holding the hand wheel steady (Figure 32).
3. Rotate the weight transfer hand wheel (Figure 32) as follows:
   - counterclockwise to reduce weight transfer
   - clockwise to increase weight transfer

   Note: The recommended setting for the weight transfer/traction assistance is to increase the weight transfer until the cutting units start to lift, then rotate the hand wheel 1/2 turn counterclockwise.
4. Tighten the lock wheel (Figure 32).

Clearing the Cutting Units

⚠ WARNING

Never attempt to rotate the cutting units by hand. Residual pressure in the hydraulic system could cause the cutting unit(s) to rotate suddenly when you release the blockage, which may cause serious injury.

- **Always wear protective gloves and use a suitable strong wooden instrument.**
- **Ensure that the wooden instrument fits in the flail rotor and is long enough to provide leverage to release the blockage.**

1. Park the machine on a level surface.
2. Move the traction pedal to the NEUTRAL position, engage the parking brake, and shut off the cutting units.
3. Lower the cutting units to the ground or securely lock them in the transport positions.
4. Shut off the engine, remove the key, and wait for all moving parts to stop.
5. Release all stored energy devices.
6. Check that all moving parts are stationary.
7. Using a suitable strong wooden instrument, remove the blockage. Ensure that the wooden instrument is properly supported in the cutting unit and avoid using excessive force to prevent damage.
8. Remove the wooden instrument from the cutting unit before starting the engine.
9. Repair or adjust the cutting unit if required.

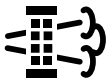
Operating Tips

Becoming Familiar with the Machine

Before mowing grass, practice operating the machine in an open area. Start and shut off the engine. Operate in forward and reverse. Lower and raise the cutting unit, and engage and disengage them. When you feel familiar with the machine, practice operating it up and down slopes.

Understanding the InfoCenter Engine Warnings

If a warning icon displays on the InfoCenter while you are operating the machine, stop the machine immediately and correct the problem. The following table includes examples of the icons that may display:

Icon	Condition
	A parked or recovery regeneration is requested.
	The power take-off is disabled.
	NOx control system malfunction

Mowing Grass

To maintain the high quality of cut, keep the rotational speed of the cutting units as high as possible. This requires high engine speed.

Cutting performance is best when cutting against the lie of the grass. To take advantage this effect, alternate the mowing direction between cuts.

Take care to not leave uncut strips of grass at the overlap at points between adjacent cutting units by avoiding tight turns.

Maximizing the Quality of Cut

The quality of cut deteriorates when the forward speed is too fast. Always balance the quality of cut with the required cutting rate, and set the forward speed accordingly.

Maximizing Engine Efficiency

Do not let the engine labor. If you notice that the engine starts to labor, reduce the forward speed or increase the height of cut. Ensure that the cutting unit blades are sharp.

Driving the Machine in Transport Mode

Important: **Take care when driving the machine over obstacles such as roadside curbs.**

Always travel at slow speed over obstacles to prevent damage to the tires, wheels, and steering system. Ensure that the tires are inflated to the recommended pressures.

Always disengage the cutting unit drive when driving the machine across areas with no grass. Be careful when driving between objects so that you do not accidentally damage the machine or the cutting units.

Using the Rear Roller Scrapers

For optimum grass discharge, remove the rear roller scrapers where conditions allow.

If mud and grass start to build up on the rollers, install the scrapers. When installing the scraper wires, tension them correctly.

After Operation

After Operation Safety

General Safety

- Park the machine on a level surface.
- Disengage and lower the cutting units.
- Engage the parking brake.
- Shut off the engine and remove the key.
- Wait for all movement to stop.
- Allow the machine to cool before adjusting, servicing, cleaning, or storing it.
- To help prevent fires, ensure that the cutting units, drives, mufflers, cooling screens, and engine compartment are free from grass and debris buildup. Clean up oil or fuel spills.
- Disengage the drive to the attachment whenever you are hauling or not using the machine.
- Maintain and clean the seat belt(s) as necessary.
- Do not store the machine or fuel container where there is an open flame, spark, or pilot light, such as on a water heater or on other appliances.

Identifying the Tie-Down Points

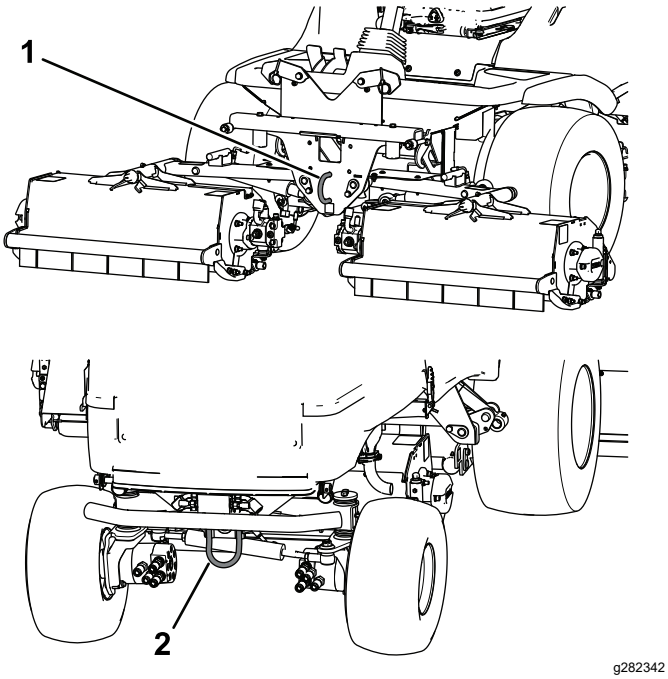


Figure 33

1. Front tie-down point
2. Rear tie-down point

Hauling the Machine

- Use full-width ramps for loading the machine onto a trailer or truck.
- Tie the machine down securely.

Towing the Machine

Ensure that the towing vehicle can control the combined weight of both vehicles; refer to Specifications (page 16).

Raising the Cutting Units

Whenever possible, raise and latch the cutting units before towing the machine.

Releasing the Wheel-Motor Brakes

1. Engage the parking brake and chock the wheels of the towing vehicle.
2. Chock the front wheels of the machine.
3. Raise the platform forward; refer to Raising the Platform (page 41).
4. Remove the 2 bolts 12 x 40 mm and 2 washers 12 mm stored in the platform support rails (Figure 34).

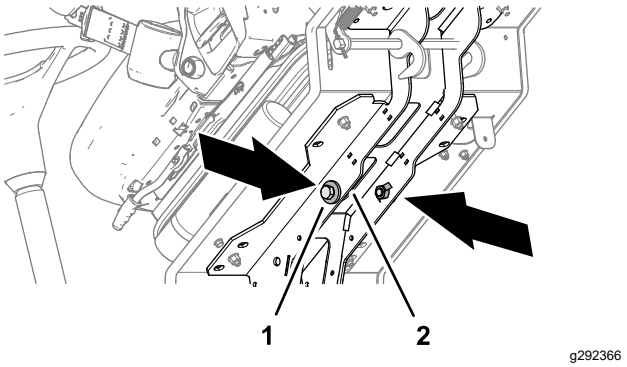
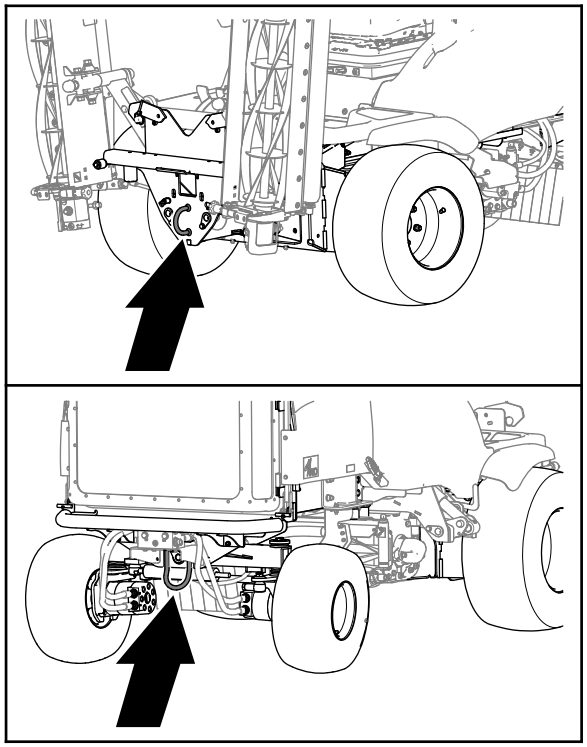


Figure 34

1. Bolt 12 x 40 mm and washers 12 mm
2. Platform support rail

5. Connect a **rigid** tow bar between the front tow ring of the machine and the tow vehicle (Figure 35).

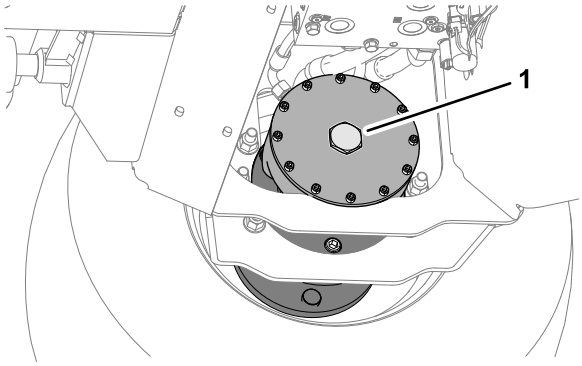
   Note: If needed, use the rear tow ring of the machine to position the machine to provide clearance, and use the front tow ring to tow the machine.



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Figure 35

6. At the right, front wheel motor brake assembly remove the hex plug (Figure 36).

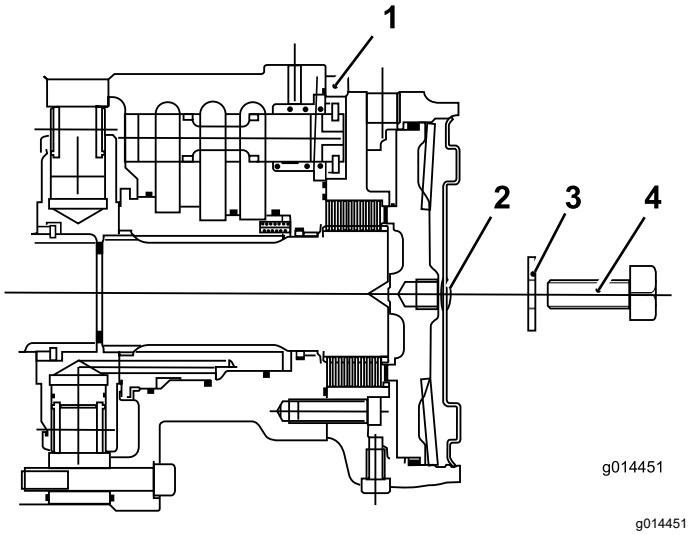


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Figure 36

1. Hex plug

7. Assemble a bolt 12 x 40 mm and washer 12 mm into the hole at the center of the motor end plate (Figure 37).



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Figure 37

1. Front wheel motor
2. Hex plug
3. Washer 12 mm
4. Bolt 12 x 40 mm

8. Tighten the bolt in the threaded hole in the brake piston until the brake releases (Figure 37).
9. Repeat steps 6 through 8 for the brake at the left side of the machine.

Bypassing the Transmission Pump

1. Use an 8 mm (5/16 inch) hex key to rotate the 2 socket head plugs for the transmission pump-relief valves counterclockwise 3 full turns (Figure 38).

   Important: **You must manually steer the machine while it is towed. When the engine is shut off, there is no hydraulic steering assist—steering the machine feels heavy.**

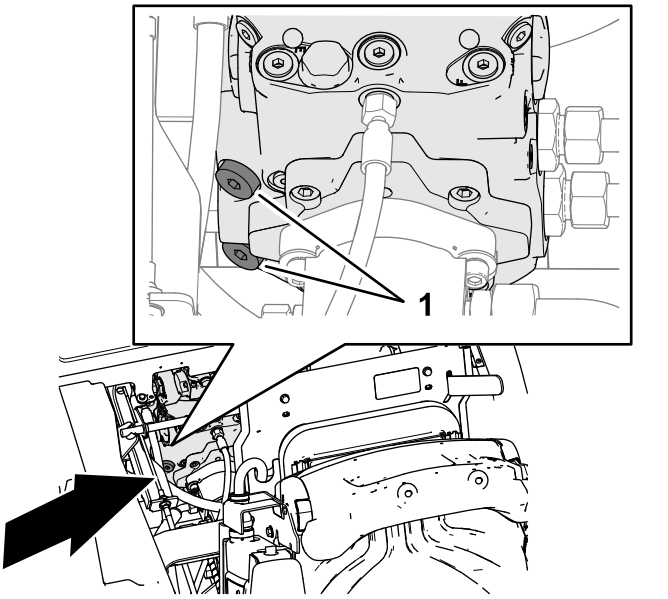


Figure 38

1. Socket head plugs (transmission pump-relief valves)

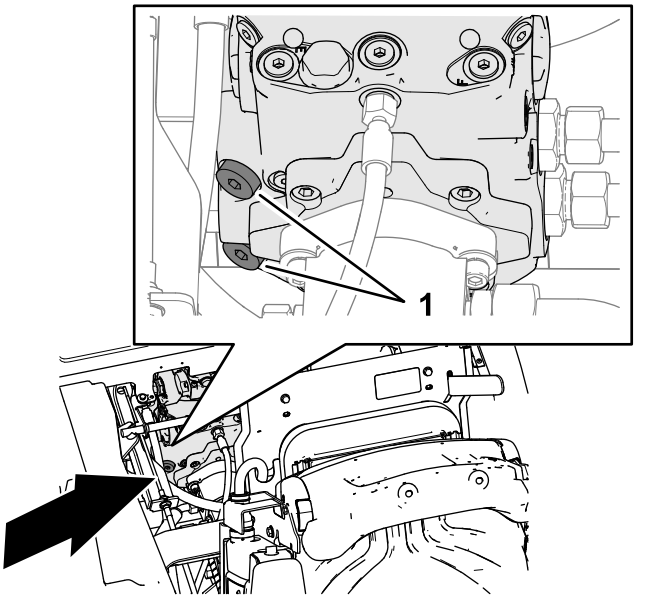


Figure 39

1. Socket head plugs (transmission pump-relief valves)

2. Lower and latch the platform; refer to Lowering the Platform (page 41).
3. Remove the wheel chocks

Towing the Machine

Important: **Do not tow the machine faster than 3 to 5 km/h (2 to 3 mph) and for no longer than 3-minutes, otherwise internal damage to the transmission may occur.**

- Use the front tow ring to tow the machine.
- Tow the machine a short distance, at slow speed, for no longer that 3-minutes.

Restoring the Transmission Pump

1. Chock the front wheels.
2. Raise the platform forward; refer to Raising the Platform (page 41).
3. Use an 8 mm (5/16 inch) hex key to rotate the 2 socket head plugs for the transmission pump-relief valves clockwise 3 turns (Figure 39).
4. Torque the 2 socket head plugs to 81 N·m (59.7 ft-lb).

Restoring the Brakes

1. Remove the bolt 12 x 40 mm and washer 12 mm from the hole at the center of the motor end plate (Figure 40).

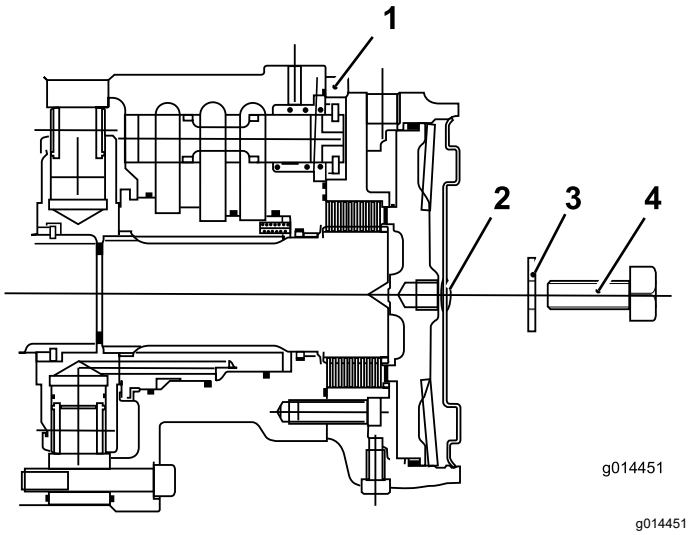
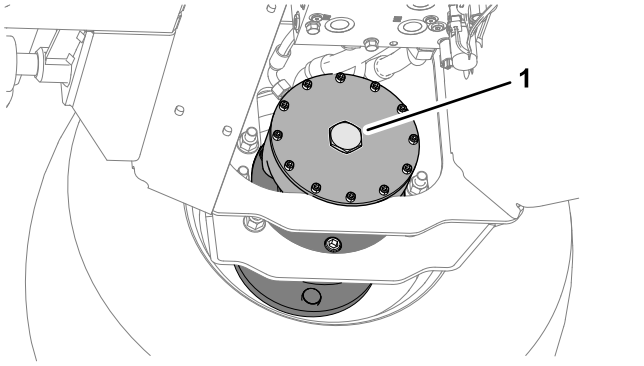


Figure 40

1. Front wheel motor
2. Hex plug
3. Washer 12 mm
4. Bolt 12 x 40 mm

2. Install the hex plug into the motor end plate (Figure 41).



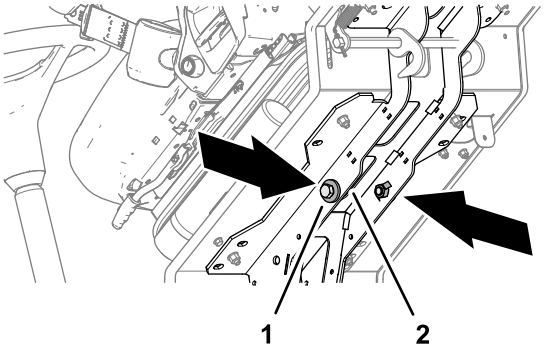
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Figure 41

1. Hex plug

3. Repeat steps 1 through 2 for the brake at the other side of the machine.
4. Remove the wheel chocks.
5. Disconnect the tow bar.

   Note: The transmission and brakes are ready for operation.
6. Stow the 2 bolts 12 x 40 mm and 2 washers 12 mm stored in the platform support rails (Figure 41).



g292366

Figure 42

1. Bolt 12 x 40 mm and washers 12 mm
2. Platform support rail

7. Lower the platform; refer to Lowering the Platform (page 41).
8. Disconnect the tow vehicle.
9. Check the brake operation of the machine.

⚠ WARNING

Operating the machine without the braking system working properly may cause you to lose control of the machine, resulting in serious injury to you and bystanders.

Before using the machine, ensure that the braking system operates correctly. Carry out initial checks driving the machine at slow speed. Do not operate the machine with a damaged or disconnected braking system.

Maintenance

Download a free copy of the electrical or hydraulic schematic by visiting www.toro.com/en-gb and searching for your machine from the Manuals link on the home page.

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

Maintenance Safety

- Before you leave the operator's position, do the following:
  - Park the machine on a level surface.
  - Disengage and lower the cutting units.
  - Engage the parking brake.
  - Shut off the engine and remove the key.
  - Wait for all movement to stop.
  - Allow the machine to cool before adjusting, servicing, cleaning, or storing it.
- Wear appropriate clothing, including eye-protection; long trousers and substantial, slip-resistant footwear. Keep hands, feet, clothing, jewelry, and long hair away from moving parts.
- Allow machine components to cool before performing maintenance.
- If possible, do not perform maintenance while the engine is running. Keep away from moving parts.
- Operate the engine only in well-ventilated areas. Exhaust gases contain carbon monoxide, which is lethal if inhaled.
- Support the machine with jack stands whenever you work under the machine.
- Carefully release pressure from components with stored energy.
- Keep all parts of the machine in good working condition and all hardware tightened.
- Replace all worn or damaged decals.
- To ensure safe, optimal performance of the machine, use only genuine Toro replacement parts. Replacement parts made by other manufacturers could be dangerous, and such use could void the product warranty.

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first hour	• Torque the wheel lug nuts.
After the first 10 hours	• Torque the wheel lug nuts.
After the first 50 hours	• Check the alternator-belt tension.
Before each use or daily	• Check the forward and reverse traction pedal action. • Check the interlock switches: operator presence, cutting-unit drive interlock, parking brake interlock, and transmission neutral interlock. • Lubricate the grease-daily fittings. • Check the air filter-blockage indicator. • Check the engine-oil level. • Drain water or other contaminants from the water separator. • Check the tire air pressure in the front and rear tires. • Check the coolant level. • Remove debris from the screen and radiator/oil cooler. • Check the hydraulic lines and hoses. • Check the hydraulic-fluid level. • Check the height-of-cut setting. • Inspect the flail rotors and blades for damage, cracks, and loose fasteners. Replace any damaged or cracked parts. • Check the rear guard. • Check the front guards. • Check the cutting unit pivot. • Check for any unusual vibration of the rotor. • Inspect the seat belt. • Check the fasteners of the machine. • Check the cutting units.

Maintenance Service Interval	Maintenance Procedure
Every 50 hours	• Lubricate the grease every 50-hour fittings. • Service the battery. • Check the blade bolts. • Inspect the blades for damage and excessive wear. • Make sure that each blade bolt is torqued to 45 N·m (33.2 ft-lb). • Check the cutting unit pivot. • Check for excessive play in the rotor bearings. • Check the rear-roller adjustment. • Check the rear-roller scraper wire tension.
Every 250 hours	• Torque the wheel lug nuts. • Check the transmission-control cable. • Check the alternator-belt tension. • Inspect the cooling-system hoses.
Every 500 hours	• Replace the primary air filter. • Change the engine oil and filter. • Replace the fuel filter. • Replace the engine fuel filter. • Check the fuel lines and connections for deterioration, damage, or loose connections • Check the electrical system. • Check the rear wheel alignment. • If you are not using the recommended hydraulic fluid or have ever filled the reservoir with an alternative fluid, replace the hydraulic filters. • If you are not using the recommended hydraulic fluid or have ever filled the reservoir with an alternative fluid, change the hydraulic fluid.
Every 1,000 hours	• Adjust the engine valves. • If you are using the recommended hydraulic fluid, replace the hydraulic filters. • If you are using the recommended hydraulic fluid, change the hydraulic fluid.
Every 1,500 hours	• Inspect the crankcase breather system. • Flush and replace the coolant.
Every 3,000 hours	• Disassemble, clean, and assemble the soot filter of the DPF. • Inspect the ECU and related sensors and actuators. • Inspect the turbo charger. • Inspect, clean, and test the exhaust gas recirculation (EGR) valve. • Inspect and test the intake throttle valve. • Inspect and clean the injectors.
Yearly	• Replace the blades.
Every 2 years	• Replace all moving hoses. • Replace the transmission cable.

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 engine-oil level.							
Check the air filter-blockage indicator.							
Drain water the fuel/water separator.							
Check for fluid leaks.							
Check the cooling system.							
Remove debris from the screen and radiator/oil cooler.							
Grease the bearings, bushings, and pivot points.[2]							
Check the tire air pressure.							
Check the hydraulic fluid level.							
heck the hydraulic lines and hoses.							
Check the fasteners of the machine.							
Check the cutting units.							
Check the height-of-cut adjustment.							
Inspect the seat belt.							
Check the traction pedal operation.							
Check the instrument operation.							
Check unusual engine noises.[1]							
Check the interlock switch operation.							
Check the brake operation.							
Check unusual operating noises.							
Wash the machine.[2]							
Touch-up damaged paint.							

1. Check the glow plug and injector nozzles if the engine starts hard, produces excess smoke, or runs rough.
2. Grease the machine immediately after every washing, regardless of the interval listed

Notation for Areas of Concern

Inspection performed by:

Item	Date	Information
1		
2		
3		
4		
5		
6		

Pre-Maintenance Procedures

Raising the Platform

1. Move the platform-latch handle (Figure 43) toward the front of the machine until the latch hooks clear the locking bar.

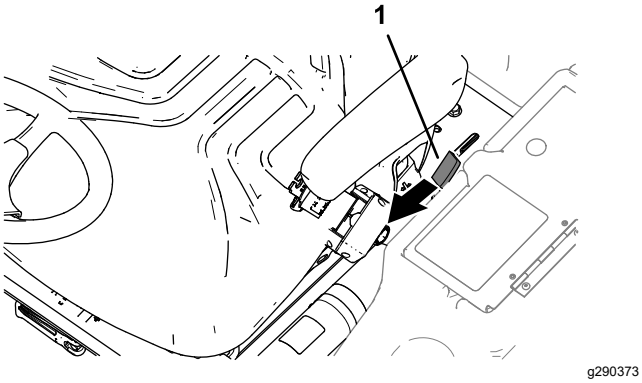


Figure 43

1. Platform-latch handle

2. Raise the platform (Figure 44).

   Note: The gas lift cylinder assists lifting the platform.

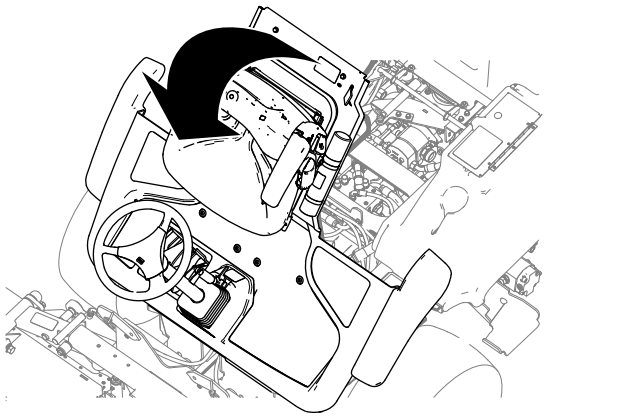


Figure 44

Lowering the Platform

⚠ WARNING

Operating the machine with the platform unlatched may cause you to lose control of the machine, resulting in serious injury to you and bystanders.

Never operate the machine without first checking that the operator platform latching mechanism is fully engaged and in good working order.

1. Lower the platform carefully (Figure 45).

   Note: The gas lift cylinder helps support the platform.

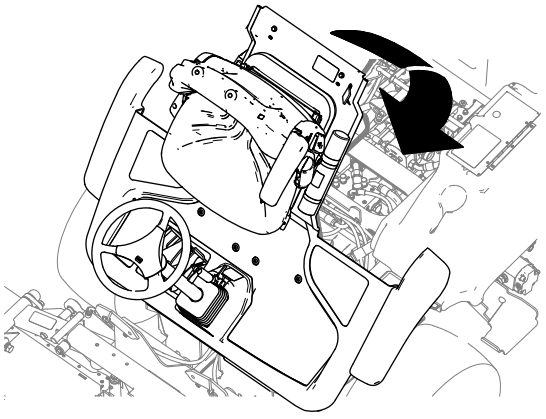


Figure 45

2. As the platform nears the fully lowered position, move the platform-latch handle (Figure 46) toward the front of the machine.

   Note: This ensures that the latch hooks clear the locking bar.

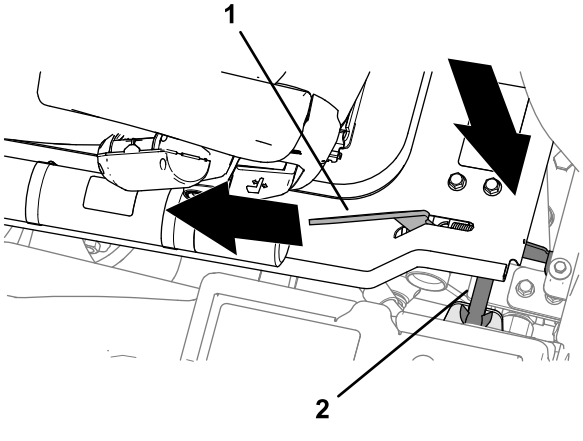


Figure 46

1. Platform-latch handle
2. Locking bar

3. Fully lower the platform and move the platform-latch handle toward the rear of the machine until the latch hooks fully engage the locking bar (Figure 47).

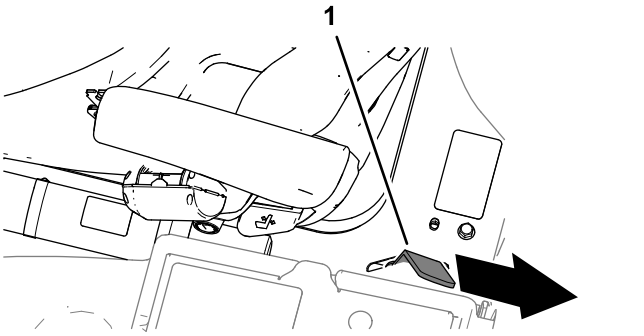


Figure 47

1. Platform-latch handle

Removing the Storage Compartment

1. At the left side of the operator's platform, open the door of the storage compartment (Figure 48).

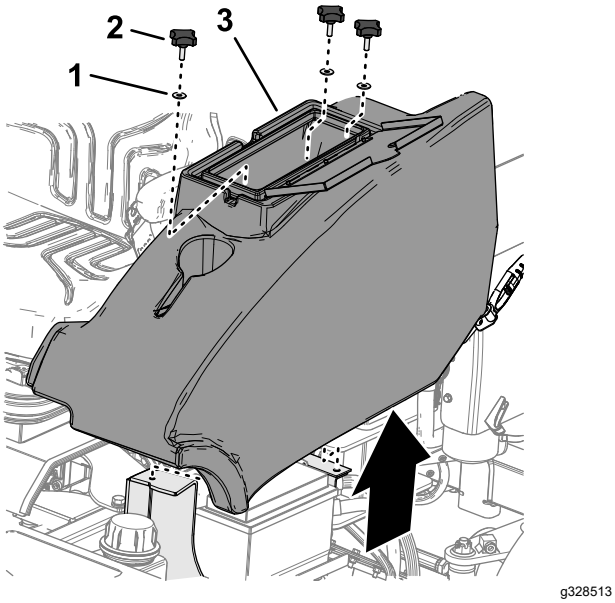


Figure 48

1. Washer
2. Knob
3. Storage compartment

2. Remove the 3 knobs and 3 washers that secure the storage compartment to the machine, and remove the compartment (Figure 48).

Installing the Storage Compartment

1. Align the holes on the bottom of the storage compartment with the holes in the chassis brackets.
2. Assemble the storage compartment to the machine with the 3 knobs and 3 washers (Figure 49)

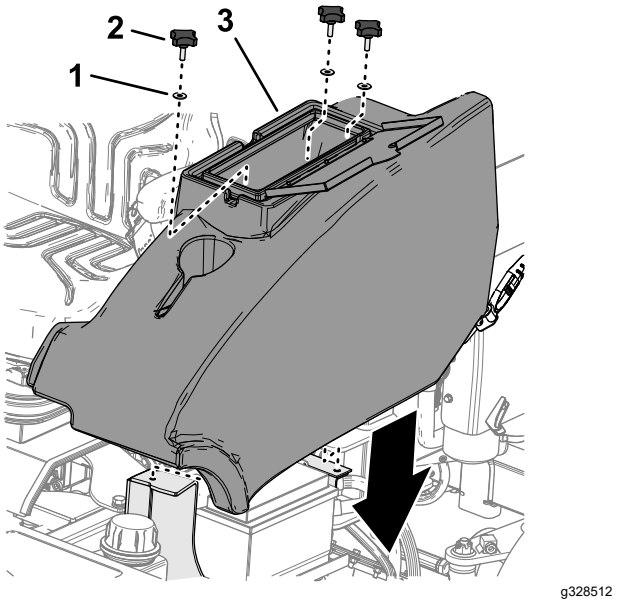


Figure 49

1. Washer
2. Knob
3. Storage compartment

3. Close the storage-compartment door.

Locating the Lift Points

Note: Use jack stands to support the machine when you lift it.

⚠ WARNING

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

Use jack stands when supporting the machine.

- Front—under the front arm mount
- Rear—axle tube on the rear axle

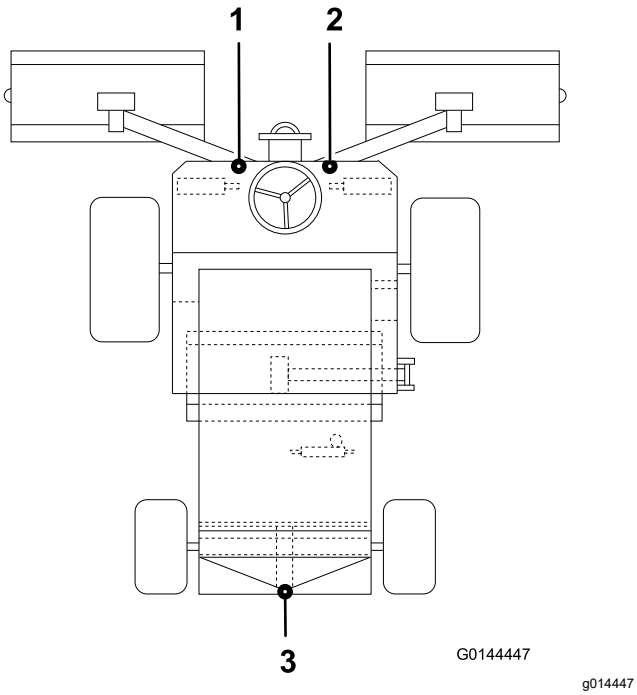


Figure 50

1. Front left lift point
2. Front right lift point
3. Rear lift point

Greasing the Bearings, Bushings, and Pivots

Service Interval: Before each use or daily—Lubricate the grease-daily fittings.

Every 50 hours—Lubricate the grease every 50-hour fittings.

Important: **Lubricate the bearings, bushings, and pivot points immediately after every washing, regardless of the service interval listed.**

Grease specification: No. 2 lithium grease.

- Use 1 pump of grease on the height-of-cut adjusters and 3 pumps of grease on all other grease fittings
- Refer to Figure 51 for the grease fitting locations.
- Replace any damaged grease fittings.

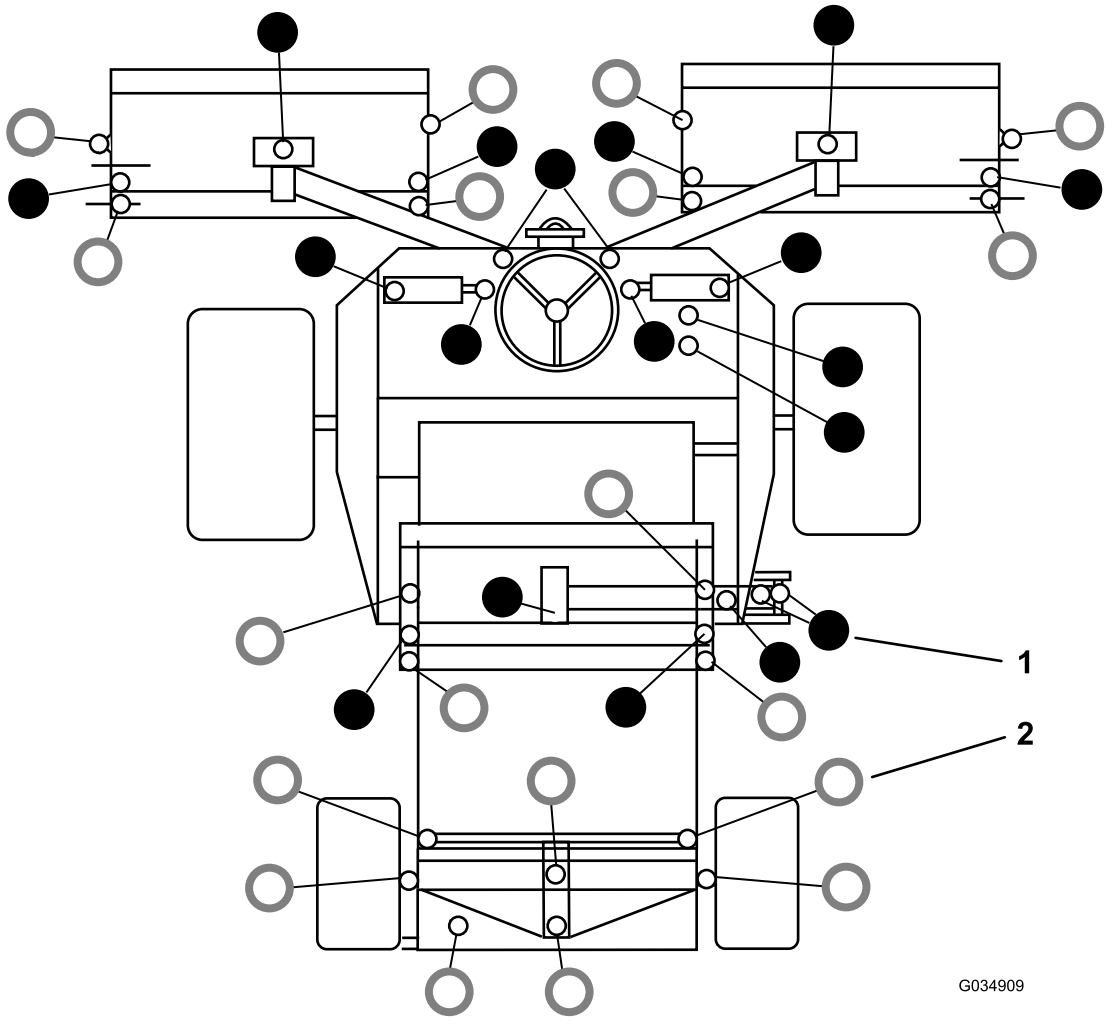


Figure 51

1. ● – Grease every 50 hours
2. ○ – Grease daily

Engine Maintenance

Engine Safety

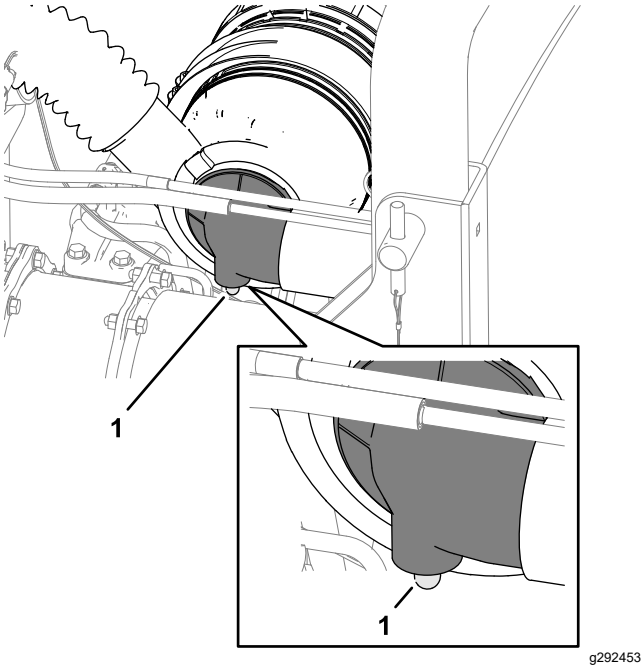
- Shut off the engine before checking the oil or adding oil to the crankcase.
- Do not change the governor speed or overspeed the engine.

Checking the Air Filter-Blockage Indicator

Service Interval: Before each use or daily

1. Open the hood.
2. Check the air filter-blockage indicator (Figure 52).

   Important: **If the indicator is red, inspect the primary air filter and replace it if it is dirty or damaged; refer to Replacing the Primary Air Filter (page 45).**



g292453

Figure 52

1. Filter-blockage indicator

3. If the filter-blockage indicator is not red, close the hood.

Replacing the Primary Air Filter

Service Interval: Every 500 hours

Check the air-cleaner body for damage that could cause an air leak. Replace the air-cleaner body if damaged. Check the whole intake system for leaks, damage, or loose hose clamps.

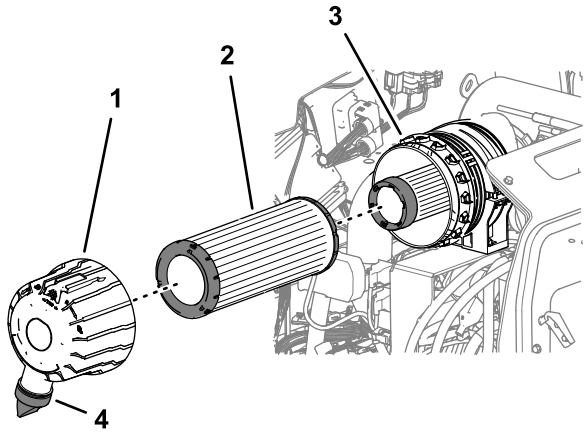
Note: Service the primary air filter when the filter-blockage indicator (Figure 52) is red. Changing the air filter frequently increases the chance of dirt entering the engine when the filter is removed.

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

1. Before removing the air-filter cover, use low pressure air (40 psi, clean and dry) to help remove large accumulations of debris packed outside of the filter canister.

   Note: This cleaning process prevents debris from migrating into the intake when the filter is removed.

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



g292455

Figure 53

1. Air-filter cover
2. Primary air filter
3. Canister
4. Dirt ejection port

2. Remove the cover from the air-cleaner body.
3. Remove the primary air filter (Figure 53).

   Important: **Do not clean and reuse a used element because of possible damage to the filter element.**

4. Inspect the new filter for shipping damage, checking the sealing end of the filter and the body.

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

5. Insert the new filter by applying pressure to the outer rim of the element to seat it in the canister.

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

6. Clean the dirt ejection port located in the air-filter cover. Remove the rubber outlet valve from the

cover, clean the cavity in the valve, and install the outlet valve into the air-filter cover.

7. Align the dirt ejection port air-filter cover between 5 o'clock to 7 o'clock when viewed from the end, assemble the cover to the canister, and secure the cover.
8. Check the condition of the air-cleaner hoses.

Replacing the Safety Filter

The air filter has a secondary, safety filter element inside the primary air filter to prevent dislodged dust and other items from entering the engine while changing the main element.

Replace the safety filter; never clean it.

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

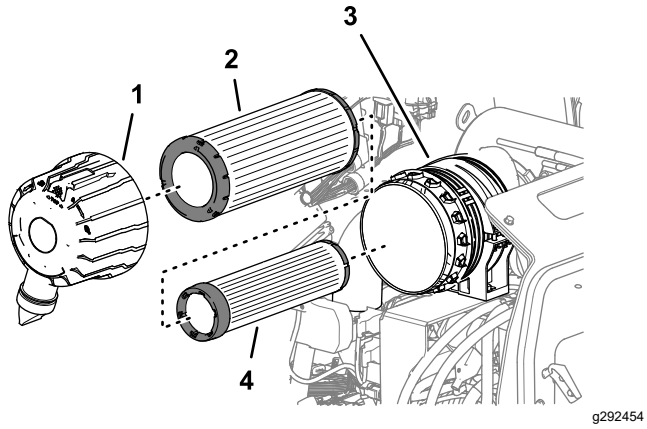


Figure 54

1. Air-filter cover
2. Primary air filter
3. Canister
4. Safety filter

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

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 oil gauge; the engine may fail if you run it with too much or too little oil.**

1. Park the machine on a level surface, lower the cutting units, shut off the engine, engage the parking brake, and remove the key.
2. Unlock the engine-cover latches and open the engine cover.
3. Remove the dipstick, wipe it clean, install the dipstick into the tube, and pull it out again. The oil level should be between the FULL and ADD marks (Figure 55).

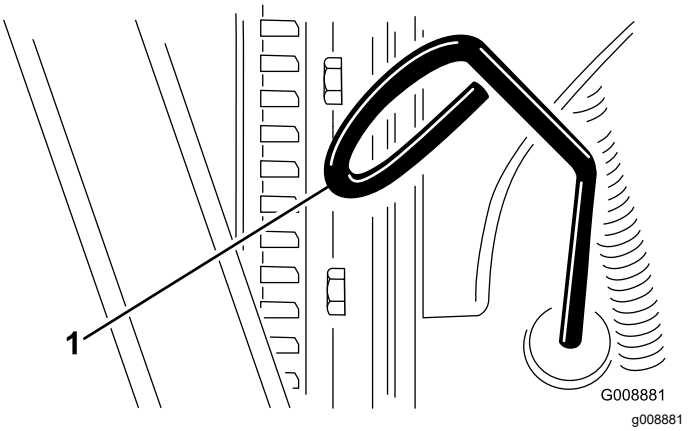


Figure 55

1. Dipstick

4. If the oil level is low, remove the fill cap and add oil until it is between the FULL and ADD marks (Figure 55).

   Note: Do not overfill the engine.

5. Install the oil-fill cap and dipstick.
6. Close the engine cover and secure it with the latches.

Crankcase Oil Capacity

5.5 L (5.8 US qt) with the filter

Changing the Engine Oil and Filter

Service Interval: Every 500 hours—Change the engine oil and filter.

1. Remove the drain plug and let the oil flow into a drain pan (Figure 56).

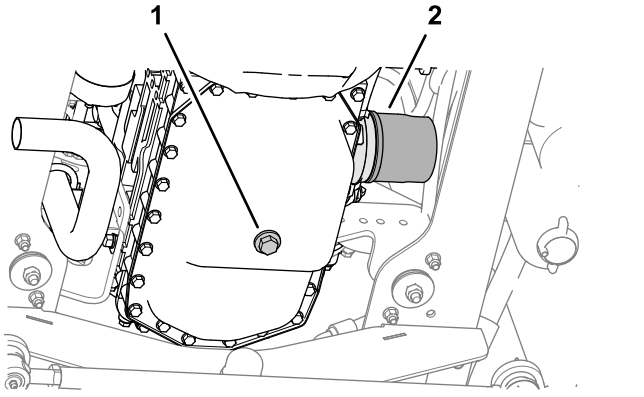


Figure 56

1. Engine-oil drain plug
2. Oil filter

2. When all the oil is drained, install the drain plug and tighten it to 54 to 63 N·m (39 to 47 in-lb).
3. Remove the oil filter.
4. Apply a light coat of clean oil to the oil filter gasket.
5. Thread the oil filter onto the engine until it contacts the mounting surface, and tighten the filter an additional turn.

   Important: **Do not overtighten the filter.**

6. Add oil to the crankcase; refer to Oil Specification (page 46) and Checking the Engine-Oil Level (page 46).

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

Service Interval: Every 3,000 hours—Disassemble, clean, and assemble the soot filter of the DPF. Clean the soot filter if engine faults SPN 3251 FMI 0, SPN 3720 FMI 0, or SPN 3720 FMI 16 display in the InfoCenter; contact an Authorized Service Dealer.

If engine faults CHECK ENGINE SPN 3251 FMI 0, CHECK ENGINE SPN 3720 FMI 0, or CHECK ENGINE SPN 3720 FMI 16 display in the InfoCenter (Figure 57), clean the soot filter using the steps that follow:

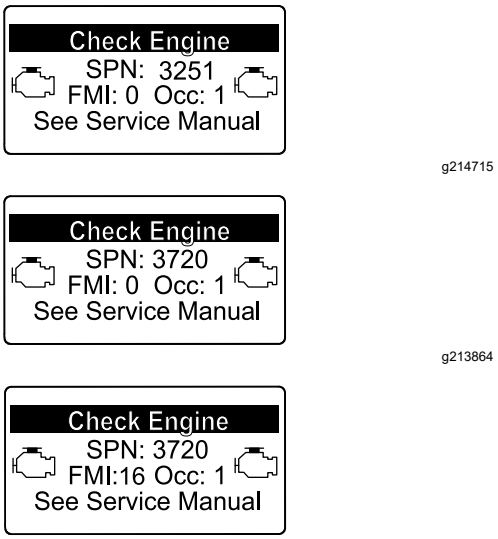


Figure 57

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 reset the engine ECU after you install a clean DPF.

Extended Engine Maintenance

Service Interval: Every 1,000 hours Refer to the *Engine Service Manual*.

Every 1,500 hours—Inspect the crankcase breather system. Contact an Authorized Service Dealer.

Every 3,000 hours—Inspect the ECU and related sensors and actuators. Contact an Authorized Service Dealer.

Every 3,000 hours—Inspect the turbo charger. Contact an Authorized Service Dealer.

Every 3,000 hours—Inspect, clean, and test the exhaust gas recirculation (EGR) valve. Contact an Authorized Service Dealer.

Every 3,000 hours—Inspect and test the intake throttle valve. Contact an Authorized Service Dealer.

Every 3,000 hours—Inspect and clean the injectors. Contact an Authorized Service Dealer.

Fuel System Maintenance

⚠ DANGER

Under certain conditions, 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.

- **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 25 mm (1 inch) below the top of the tank, not the filler neck. This empty space in the tank allows the fuel to expand.**
- **Never smoke when handling fuel, and stay away from an open flame or where spark can ignite fuel fumes.**
- **Store fuel in a clean, safety-approved container and keep the cap in place.**

Fuel Maintenance

This *Operator's Manual* contains more detailed fuel and fuel system maintenance information than the Yanmar® engine *Owner's Manual*, which is a general-purpose reference relating to fuel and fuel maintenance.

Ensure that you understand that the fuel system maintenance, fuel storage, and fuel quality require your attention to avoid downtime and extensive engine repairs.

The fuel system has extremely tight tolerances due to the emissions and control requirements. Diesel fuel quality and cleanliness is more important for the longevity of today's high-pressure common rail (HPCR) fuel-injection system used on diesel engines.

Important: **Water or air in the fuel system will damage your engine! Do not assume that new fuel is clean. Ensure that your fuel is from a quality supplier, store your fuel correctly, and use your fuel supply within 180 days.**

Important: **If you do not follow the procedures for fuel filter replacement, fuel system maintenance, and fuel storage, the engine fuel system could fail prematurely. Perform all fuel system maintenance at the specified intervals or whenever the fuel is contaminated or its quality is poor.**

Storing Fuel

Appropriate fuel storage is critical for your engine. Proper maintenance of fuel storage tanks is often overlooked and leads to the contamination of fuel delivered to the machine.

- Acquire only enough fuel that you will consume within 180 days. Do not use fuel that has been stored for more than 180 days. This helps eliminate water and other contaminates in the fuel.
- If you do not remove the water from the storage tank or machine fuel tank, it can lead to rust or contamination in the storage tank and fuel system components. Tank sludge developed by mold, bacteria, or fungus restricts flow and clogs the filter and fuel injectors.
- Inspect your fuel storage tank and machine fuel tank regularly to monitor the fuel quality in the tank.
- Ensure that your fuel comes from a quality supplier.
- If you find water or contaminants in your storage tank or machine fuel tank, work with your fuel provider to correct the problem and perform all fuel system maintenance.
- Do not store diesel fuel in tanks or canisters made with zinc-plated components.

Servicing the Water Separator

Service Interval: Before each use or daily—Drain water or other contaminants from the water separator.

1. Park the machine on a level surface, lower the cutting units, engage the parking brake, shut off the engine, and remove the key.
2. Place a clean container under the fuel filter.
3. Loosen the drain valve at the bottom of the filter canister and open the vent screw at the top of the canister mount.

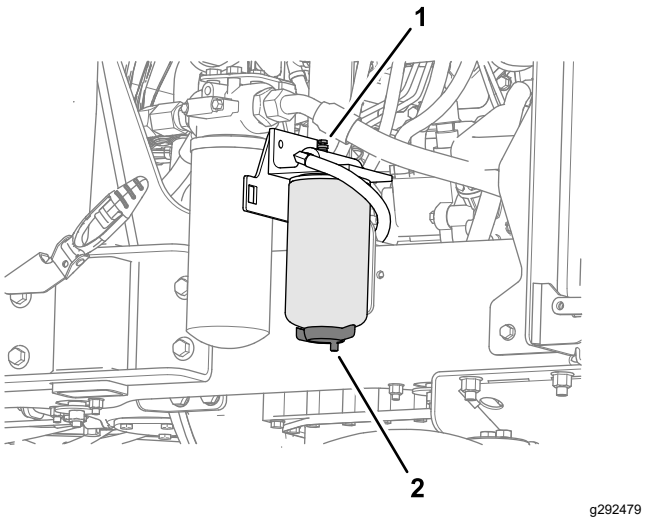


Figure 58

1. Vent screw
2. Drain valve (water separator filter)

4. Tighten the drain valve at the bottom of the filter canister and close the vent screw at the top of the canister mount.
5. Prime the fuel system; refer to Priming the Fuel System (page 49).

Priming the Fuel System

Prime the fuel system under the following conditions:

- Before starting the engine for the first time.
- If you run out of fuel and then add new fuel to the system.
- After performing maintenance to the fuel system, such as changing the fuel filter, draining the water separator, or replacing a fuel-system component.

To prime the fuel system, rotate the key switch to the ON position for 10 to 15 seconds to allow the electric fuel pump to prime the fuel system.

Important: **Do not use the starter motor to crank the engine to prime the fuel system. You will damage the starter motor.**

Replacing the Fuel-Water Filter

Service Interval: Every 500 hours

Important: **Replace the fuel filter canister periodically to prevent wear of the fuel injection pump plunger or the injection nozzle, due to dirt in the fuel.**

1. Place a clean container under the fuel filter canister (Figure 59).

2. Drain the fuel filter canister; refer to Servicing the Water Separator (page 49).
3. Clean the area around the fuel filter and filter head (Figure 59).

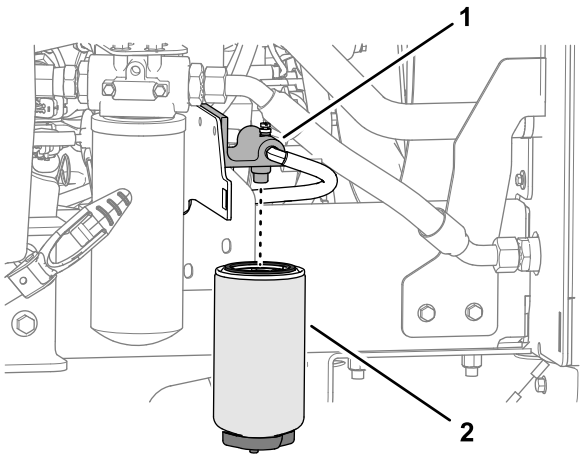


Figure 59

1. Filter head
2. Fuel filter

4. Remove the filter canister and clean the filter head (Figure 59).
5. Lubricate the gasket on the filter canister with clean diesel fuel.
6. Install the new filter canister by hand until the gasket contacts mounting surface.
7. Prime the fuel system; refer to Priming the Fuel System (page 49).

Servicing the Engine Fuel Filter

Service Interval: Every 500 hours—Replace the engine fuel filter.

Note: Refer to the engine owner's manual included with the machine for additional information.

1. Clean the area around the fuel-filter head (Figure 60).

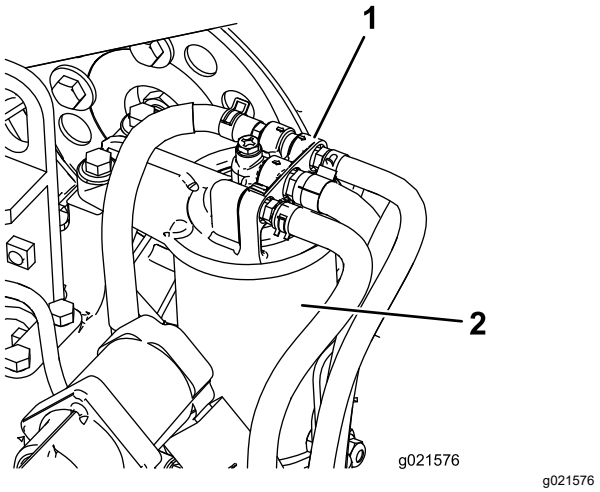


Figure 60

1. Fuel-filter head
2. Fuel filter

2. Remove the filter and clean the filter-head mounting surface (Figure 60).
3. Lubricate the filter gasket with clean diesel fuel.
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.

Checking the Fuel Lines and Connections

Service Interval: Every 500 hours (or yearly, whichever comes first).

Check the fuel lines and connections for deterioration, damage, or loose connections.

Fuel Pick-up Tube Screen

The fuel pick-up tube is located inside the fuel tank. The pick-up tube is equipped with a screen to help prevent debris from entering the fuel system. Remove the fuel pick-up tube and clean screen as required.

Electrical System Maintenance

Important: **Before welding on the machine, disconnect both cables from the battery, both wire harness plugs from the electronic control modules, and the terminal connector from the alternator to prevent damage to the electrical system.**

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.

Battery Maintenance

⚠ DANGER

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

- **Do not drink electrolyte and avoid contact with skin, eyes, or clothing. Wear safety glasses to shield your eyes and rubber gloves to protect your hands.**
- **Fill the battery where clean water is always available for flushing the skin.**

⚠ WARNING

Charging the battery produces gasses that can explode.

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

Keep the terminals and the entire battery case clean because a dirty battery discharges slowly. To clean the battery, wash the entire case with a solution of baking soda and water. Rinse it with clear water.

Servicing the Battery

Service Interval: Every 50 hours (or weekly, whichever comes first)

Important: **When removing the battery, always disconnect the negative (-) cable first.**

Important: **When installing the battery, always connect the negative (-) cable last.**

Under normal operating conditions the battery does not require any further attention. If the machine has been subject to continuous use under high ambient temperature conditions, the battery electrolyte may require adding water.

1. Remove the storage compartment; refer to Removing the Storage Compartment (page 42).
2. Remove any corrosion from the battery terminals using a wire brush and to prevent further corrosion.

   Note: Check the condition of the battery cables. Install new cables when current ones are showing signs of wear or damage and tighten any loose connections as necessary.
3. Apply Grafo 112X skin-over grease (Toro Part No. 505-47) or petroleum jelly to the terminals.
4. Clean the battery compartment.
5. Remove the cell covers and if needed add distilled water to a height 15 mm below the top of the battery. Install the cell covers.
6. Install the storage compartment; refer to Installing the Storage Compartment (page 42).

Checking the Electrical System

Service Interval: Every 500 hours

Inspect all electrical connections and cables and replace any which are damaged or corroded. Spray a good-quality water inhibitor onto exposed connections to prevent moisture ingress.

Checking the Fuses

1. Remove the storage compartment; refer to Removing the Storage Compartment (page 42).
2. Remove the fuse-block cover (Figure 61)

   Note: The fuse block is located next to the battery.

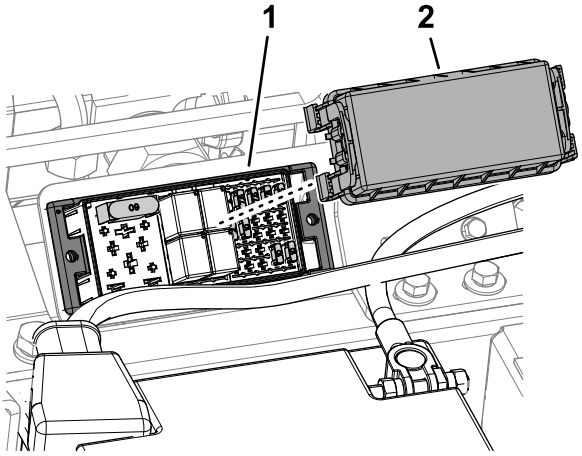


Figure 61

1. Fuse block
2. Fuse-block cover

3. Check for open fuses.

   Note: There are 10 fuses in the electrical system.
4. Replace any open fuse with a fuse of equal amperage capacity.

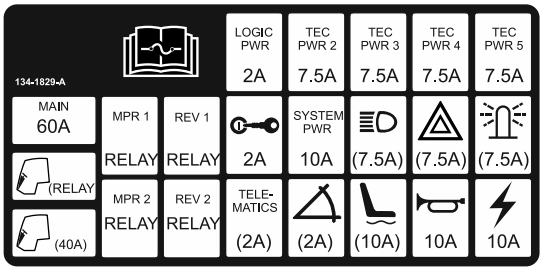


Figure 62

5. Install the fuse-block cover (Figure 61).
6. Install the storage compartment; refer to Installing the Storage Compartment (page 42).

Drive System Maintenance

Checking the Tire Air Pressure

Service Interval: Before each use or daily

Important: **Maintain correct tire pressure in all tires to ensure correct contact with the turf.**

Recommended tire pressure is 1 bar (14.5 psi) for general all around use. Adjust the tire air pressures according to the following table depending on operating conditions.

Tires	Tire Type	Recommended Tire Pressures		
		Turf Conditions	Road Conditions	Maximum Pressure
Front Axle	26 x 12.0 - 12 BKT turf pattern	0.7 bar (10 psi)	1.4 bar (20 psi)	1.4 bar (20 psi)
Rear Axle	20 x 10.0 - 8 BKT turf pattern	0.7 bar (10 psi)	1.4 bar (20 psi)	1.5 bar (22 psi)

Checking the Torque of the Wheel Nuts

Service Interval: After the first hour

After the first 10 hours

Every 250 hours

Front wheel nuts torque specification: 200 N·m (148 ft-lb)

Rear wheel nuts torque specification: 100 N·m (74 ft-lb)

⚠ WARNING

Failure to maintain proper torque of the wheel nuts could result in personal injury.

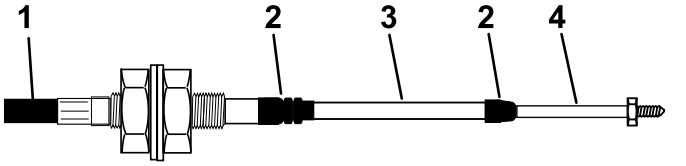
Maintain the proper torque on the wheel nuts.

Inspecting the Transmission Control Cable and Operating Mechanism

Service Interval: Every 250 hours

Check the condition and security of the cable and operating mechanism at the speed-control pedals and transmission pump ends.

- Remove buildup of dirt, grit, and other debris.
- Ensure that the ball joints are securely anchored and check that the mounting brackets and cable anchors are tight and free from cracks.
- Inspect end fittings for wear, corrosion, broken springs, and replace if necessary.
- Ensure that the rubber seals are correctly located and are in good condition.
- Ensure that the articulating sleeves supporting the inner cable are in good condition and firmly attached to the outer cable assembly at the crimped connections. If there are any signs of cracking or detachment install a new cable immediately.
- Check that sleeves, rods, and inner cable are free from bends, kinks, or other damage. If they are not, install a new cable immediately.
- With the engine shut off, operate the pedal controls through the entire range and ensure that the mechanism moves smoothly and freely to the neutral position without sticking or hanging up.



g014571

Figure 63

1. Outer cover
2. Rubber seal
3. Sleeve
4. Rod end

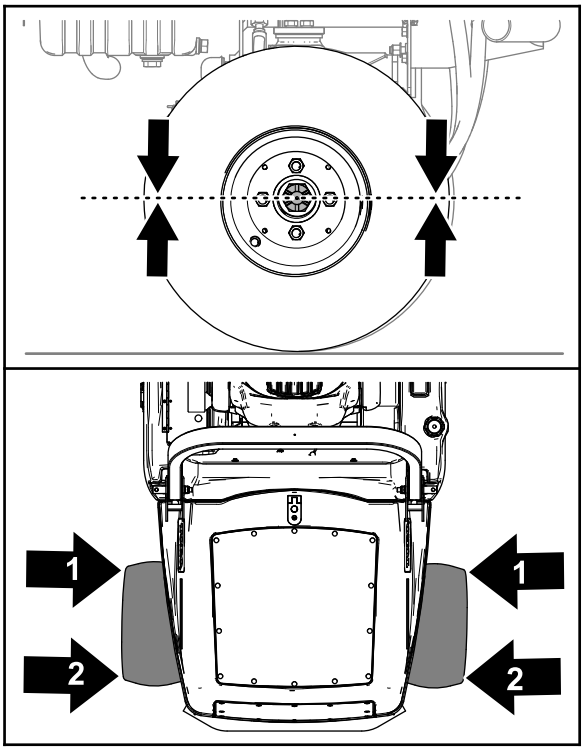
Checking the Rear Wheel Alignment

Service Interval: Every 500 hours

To prevent excessive tire wear and ensure safe machine operation, the front and back of the rear wheels must align within 5 mm (0.20 inch) or less.

1. Turn the steering wheel to align the rear wheels straight ahead.
2. At axle height, measure the distance between the front of the rear wheels and between the rear of the rear wheels.

   Note: The wheels are aligned if the difference between the front and rear measurements are 5 mm (0.20 inch) or less.



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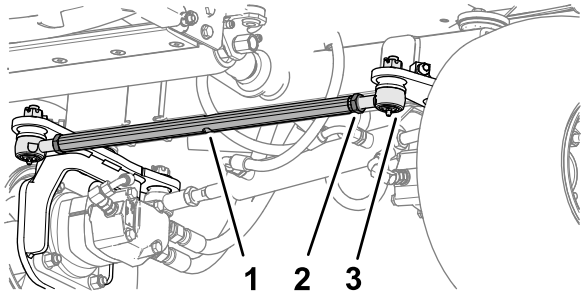
Figure 64

1. Front measurement
2. Rear measurement

3. If the difference between the front and rear measurements is greater that 5 mm (0.20 inch), align the rear wheels; refer to Adjusting Rear Wheel Toe-In (page 53)

Adjusting Rear Wheel Toe-In

1. At the front of the rear wheel, loosen the 2 jam nuts securing the track rod assembly to the rod ends (Figure 65).



g348714

Figure 65

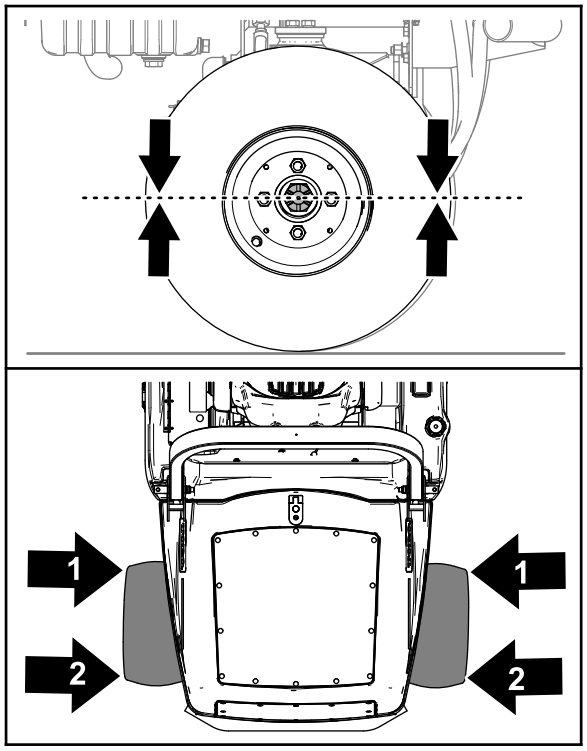
1. Track rod assembly
2. Jam nut
3. Rod end

2. Align the wheels by rotating the track rod (Figure 65).

   Note: Use the wrench flats of the track rod to turn it.

3. At axle height, measure the distance between the front of the rear wheels and between the rear of the rear wheels.

   Note: The wheels are aligned if the difference between the front and rear measurements are 5 mm (0.20 inch) or less.



g348713

Figure 66

1. Front measurement
2. Rear measurement

4. Repeat steps 2 and 3 until the wheels are aligned.
5. Tighten the 2 jam nuts to secure the track rod assembly and the rod ends (Figure 65).

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.

Coolant Specification

The coolant reservoir is filled at the factory with a 50/50 solution of water and ethylene glycol base extended-life coolant.

Important: **Use only commercially available coolants that meet the specifications listed in the Extended Life Coolant Standards Table.**

Do not use conventional (green) inorganic-acid technology (IAT) coolant in your machine. Do not mix conventional coolant with extended-life coolant.

Coolant Type Table

Ethylene-Glycol Coolant Type	Corrosion Inhibitor Type
Extended-life antifreeze	Organic-acid technology (OAT)

Important: **Do not rely on the color of the coolant to identify the difference between conventional (green) inorganic-acid technology (IAT) coolant and extended-life coolant.**

Coolant manufacturers may dye extended-life coolant in one of the following colors: red, pink, orange, yellow, blue, teal, violet, and green. Use coolant that meets the specifications in the Extended Life Coolant Standards Table.

Extended Life Coolant Standards

ATSM International	SAE International
D3306 and D4985	J1034, J814, and 1941

Important: **Coolant concentration should be a 50/50 mixture of coolant to water.**

- **Preferred:** When mixing coolant from a concentrate, mix it with distilled water.

- **Preferred option:** If distilled water is not available, use a pre-mix coolant instead of a concentrate.
- **Minimum requirement:** If distilled water and pre-mix coolant are not available, mix concentrated coolant with clean drinkable water.

Checking the Coolant Level

Service Interval: Before each use or daily

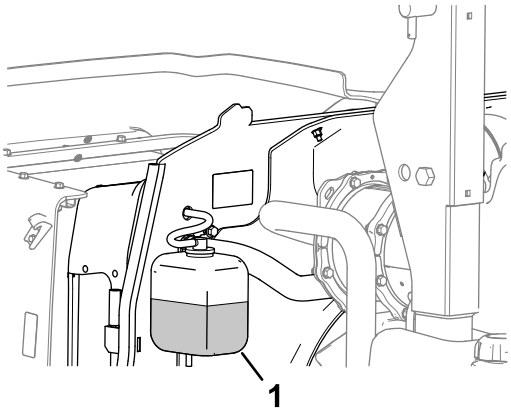
⚠ CAUTION

If the engine has been running, the pressurized, hot coolant can escape and cause burns.

- **Do not open the radiator cap when the engine is running.**
- **Use a rag when opening the radiator cap, and open the cap slowly to allow steam to escape.**

1. Check the level of coolant in the expansion tank (Figure 67).

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



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Figure 67

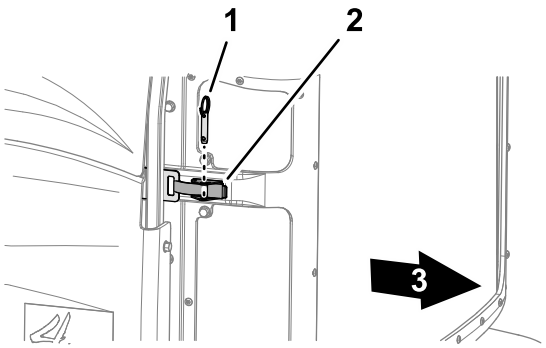
1. Expansion tank

2. If the coolant level is low, remove the expansion-tank cap and replenish the system. **Do not overfill.**
3. Install the expansion-tank cap.

Removing Debris from the Cooling System

Service Interval: Before each use or daily (More frequently in dirty operating conditions).

1. Park the machine on a level surface, lower the cutting units, shut off the engine, engage the parking brake, and remove the key.
2. Remove the ball pin from the screen latch (Figure 68)

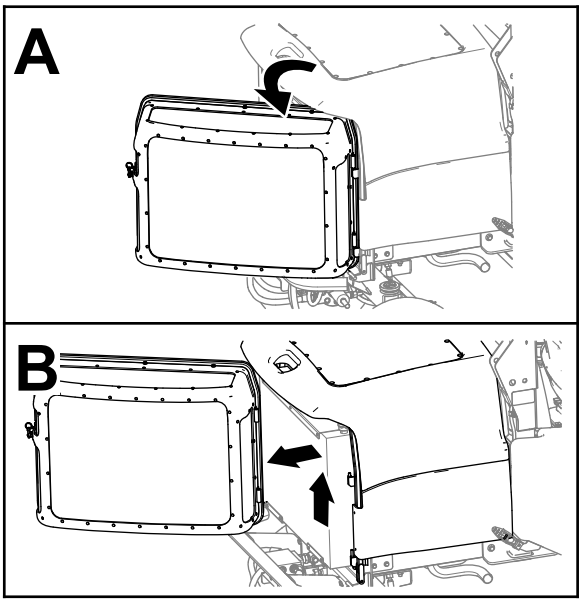


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Figure 68

1. Ball pin
2. Screen latch
3. Back of the machine

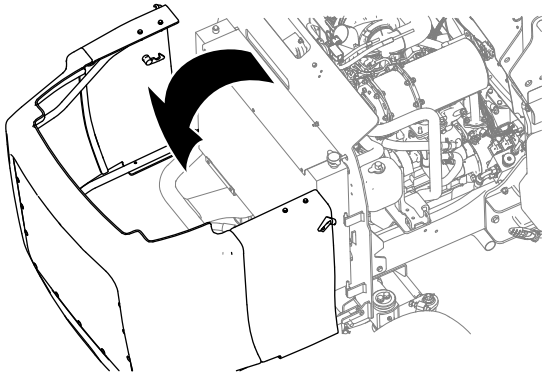
3. Unlatch the engine screen, open it, and lift it from the machine (Figure 69).



g292487

Figure 69

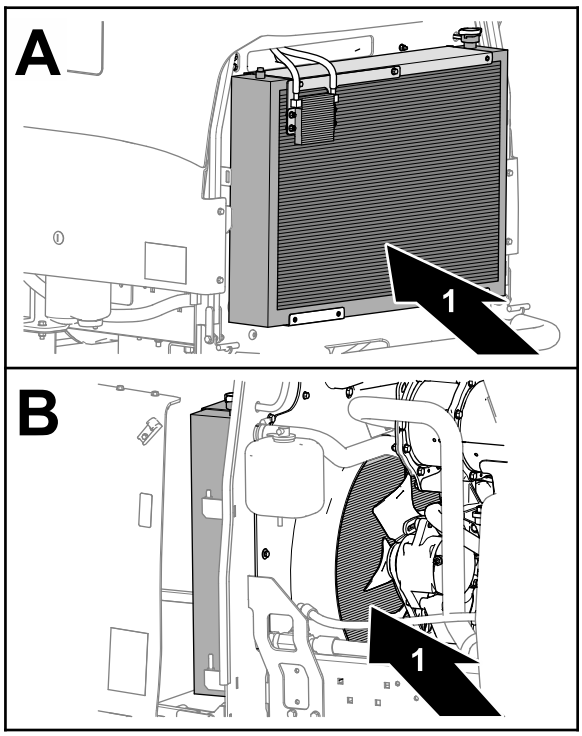
4. Clean the screens.
5. Unlatch and open the hood (Figure 70).



g292486

Figure 70

6. Thoroughly clean all debris out of the engine area.
7. Thoroughly clean both sides of the radiator and oil cooler with compressed air (Figure 71).



g328487

Figure 71

1. Radiator

8. Close and latch the hood.
9. Assemble the screen onto the pivot pins, close the screen and secure it with the latch and ball pin.

Belt Maintenance

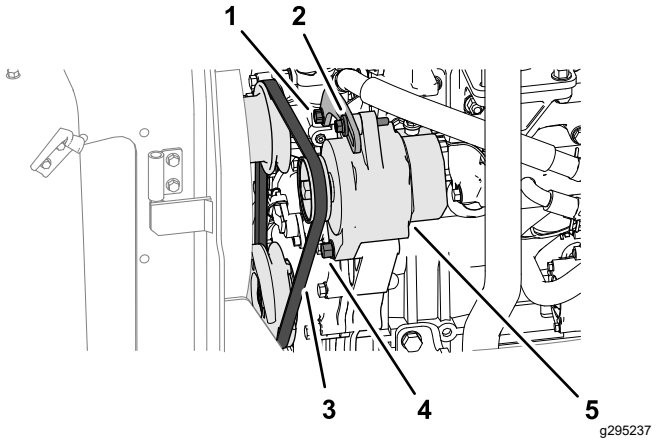
Servicing the Alternator Belt

Service Interval: After the first 50 hours

Every 250 hours

1. Apply 10 kgf (22 lb) of force against the alternator belt (Figure 72), midway between the pulleys.

   Note: The belt should deflect 10 mm (3/8 inch).



g295237

Figure 72

1. Tension bracket bolt
2. Alternator tension bolt
3. Belt
4. Alternator pivot bolt
5. Alternator

2. If the belt tension is incorrect, perform the following:
   - If belt deflection is less than 10 mm (3/8 inch), loosen the alternator pivot bolt and tension bolt (Figure 72), and reduce the belt tension.
   - If belt deflection is greater than 10 mm (3/8 inch), loosen the alternator pivot bolt and tension bolt (Figure 72), and increase the belt tension.

     Note: If needed, loosen the tension bracket bolt (Figure 72).
3. Tighten the bolts (Figure 72).
4. Check the deflection of the belt again to ensure correct belt tension.

Hydraulic System Maintenance

Hydraulic System Safety

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

Checking the Hydraulic Lines and Hoses

Service Interval: Before each use or daily

Check the hydraulic lines and hoses for leaks, kinked lines, loose mounting supports, wear, loose fittings, weather deterioration, and chemical deterioration. Make all necessary repairs before operating.

Hydraulic Fluid Specifications

The reservoir is filled at the factory with high-quality hydraulic fluid. Check the level of the hydraulic fluid before you first start the engine and daily thereafter; refer to Checking the Hydraulic Fluid Level (page 58).

Recommended hydraulic fluid: Toro PX Extended Life Hydraulic Fluid; available in 19 L (5 US gallon) pails or 208 L (55 US gallon) drums.

Note: A machine using the recommended replacement fluid requires less frequent fluid and filter changes.

Alternative hydraulic fluids: If Toro PX Extended Life Hydraulic Fluid is not available, you may use another conventional, petroleum-based hydraulic fluid having specifications that fall within the listed range for all the following material properties and that it meets industry standards. Do not use synthetic fluid. Consult with your lubricant distributor to identify a satisfactory product.

Note: Toro does not assume responsibility for damage caused by improper substitutions, so use products only from reputable manufacturers who will stand behind their recommendation.

High Viscosity Index/Low Pour Point Anti-wear Hydraulic Fluid, ISO VG 46

Material Properties:

Viscosity, ASTM D445	cSt @ 40°C (104°F) 44 to 48
Viscosity Index ASTM D2270	140 or higher
Pour Point, ASTM D97	-37°C to -45°C (-34°F to -49°F)
Industry Specifications:	Eaton Vickers 694 (I-286-S, M-2950-S/35VQ25 or M-2952-S)

Note: Many hydraulic fluids are almost colorless, making it difficult to spot leaks. A red dye additive for the hydraulic fluid is available in 20 ml (0.67 fl oz) bottles. A bottle is sufficient for 15 to 22 L (4 to 6 US gallons) of hydraulic fluid. Order Part No. 44-2500 from your authorized Toro distributor.

Important: **Toro Premium Synthetic Biodegradable Hydraulic Fluid is the only synthetic biodegradable fluid approved by Toro. This fluid is compatible with the elastomers used in Toro hydraulic systems and is suitable for a wide-range of temperature conditions. This fluid is compatible with conventional mineral oils, but for maximum biodegradability and performance, the hydraulic system should be thoroughly flushed of conventional fluid. The oil is available in 19 L (5 US gallon) pails or 208 L (55 US gallon) drums from your authorized Toro distributor.**

Checking the Hydraulic Fluid Level

Service Interval: Before each use or daily

The reservoir is filled at the factory with high-quality hydraulic fluid. The best time to check the hydraulic fluid is when it is cold.

1. Park the machine on a level surface, lower the cutting units, engage the parking brake, shut off the engine, and remove the key.
2. Check the sight-level gauge on the side of the tank.

   Note: The hydraulic-fluid level needs to align with the upper mark.
3. If additional hydraulic fluid is needed, remove the storage compartment; refer to Removing the Storage Compartment (page 42).
4. Clean the area around the filler neck and the cap of the hydraulic tank (Figure 73) .

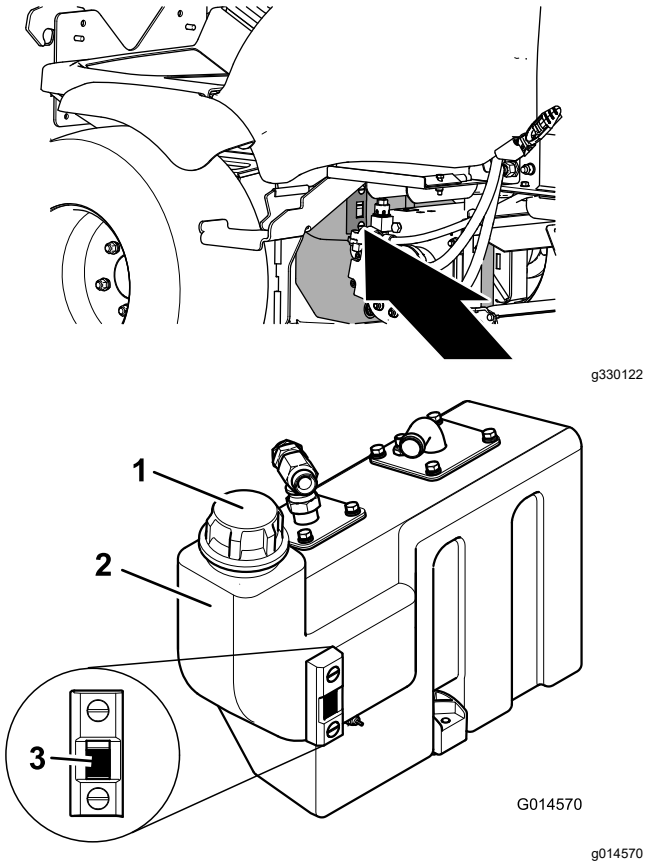


Figure 73

1. Hydraulic-tank cap
2. Fluid tank
3. Sight-level gauge

5. Remove the cap and fill the tank with the specified hydraulic fluid to the upper mark on the sight-level gauge.

   Important: **Do not overfill the tank with hydraulic fluid.**
6. Install the cap onto the tank.
7. Install the storage compartment; refer to Installing the Storage Compartment (page 42).

Changing the Hydraulic Return Filter

Service Interval: Every 1,000 hours—**If you are using the recommended hydraulic fluid,** replace the hydraulic filters.

Every 500 hours—**If you are not using the recommended hydraulic fluid or have ever filled the reservoir with an alternative fluid,** replace the hydraulic filters.

1. Park the machine on a level surface, lower the cutting units, shut off the engine, engage the parking brake, and remove the key.
2. Open the hood.
3. At the left side of the machine, clean the area around the filter head and place a drain pan under the filter (Figure 74).

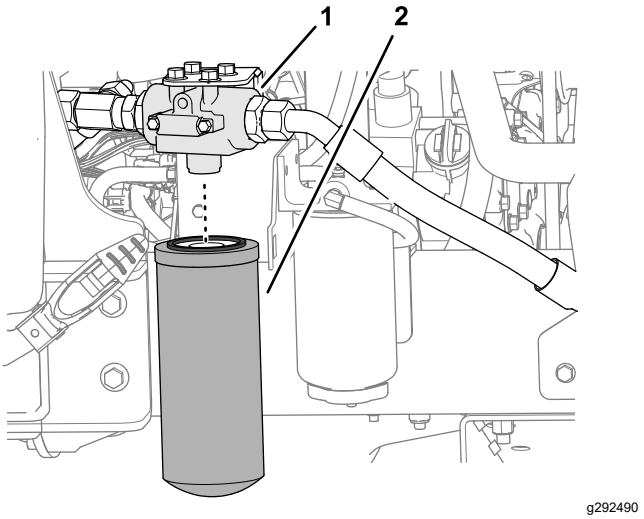


Figure 74

1. Filter head
2. Hydraulic fluid return filter

4. Remove the return filter (Figure 74).
5. Lubricate the gasket of the new return filter with clean hydraulic fluid.
6. Assemble the filter to the filter head, and tighten the filter by hand until the gasket contacts the mounting surface, then rotate it an additional 1/2 turn (Figure 74).
7. Start the engine and let it run for 2 minutes to purge air from the system.

8. Shut off the engine, remove the key, and check for leaks.
9. Close and latch the hood.

Changing the Hydraulic Fluid

Service Interval: Every 1,000 hours—**If you are using the recommended hydraulic fluid,** change the hydraulic fluid.

Every 500 hours—**If you are not using the recommended hydraulic fluid or have ever filled the reservoir with an alternative fluid,** change the hydraulic fluid.

If the fluid becomes contaminated, contact your authorized Toro distributor to flush the system. Contaminated fluid looks milky or black when compared to clean fluid.

Draining the Hydraulic Fluid

1. Park the machine on a level surface, lower the cutting units, shut off the engine, engage the parking brake, and remove the key.
2. Remove the storage compartment; refer to Removing the Storage Compartment (page 42).
3. Align a drain pan under the hydraulic tank, remove the tank drain plug, and fully drain the hydraulic fluid (Figure 75).

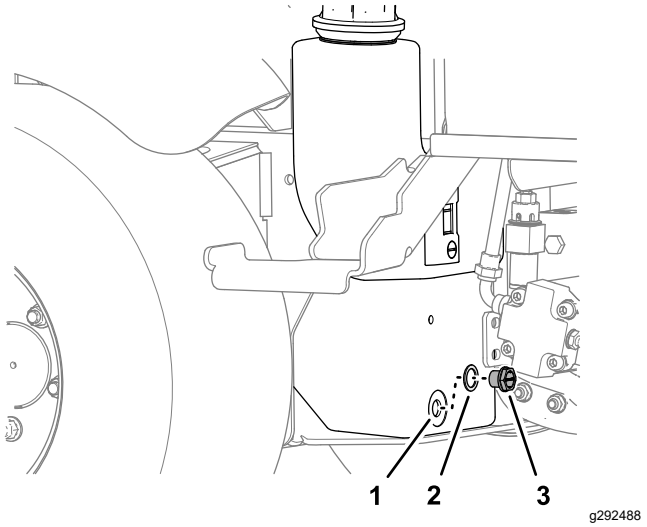


Figure 75

1. Hydraulic tank
2. Seal
3. Drain plug

4. Install the drain plug with a new seal.

Cleaning the Strainers

1. Remove the oil tank suction flange to gain access to the suction strainer (Figure 76).

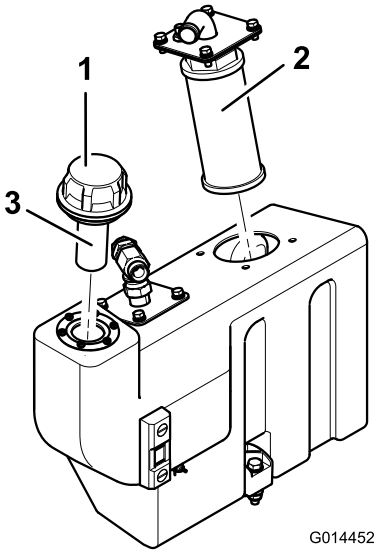


Figure 76

1. Oil-tank filler cap
2. Suction strainer
3. Filler strainer

2. Unscrew and remove the strainer and clean with paraffin or petrol before installing (Figure 76).

Hydraulic Fluid Capacity

32 L (8.5 US gallons); refer to Hydraulic Fluid Specifications (page 57)

Filling the Hydraulic Tank with Fluid

1. Fill the hydraulic tank with the specified hydraulic fluid; refer to Hydraulic Fluid Specifications (page 57) and Checking the Hydraulic Fluid Level (page 58).

   Important: **Use only hydraulic fluids specified; other hydraulic fluids could damage the system.**
2. Run the machine and operate all hydraulic systems until the hydraulic fluid is warm.
3. Check the fluid level and top up as necessary to the upper mark on the sight-level gauge.
4. Install the storage compartment; refer to Installing the Storage Compartment (page 42).

Cutting Unit Maintenance

Blade Safety

A worn or damaged blade or bedknife can break, and a piece could be thrown toward you or bystanders, resulting in serious personal injury or death.

- Inspect the blades and bedknives periodically for excessive wear or damage.
- Use care when checking the blades. Wear gloves and use caution when servicing them. Only replace or backlap the blades and bedknives; never straighten or weld them.
- On machines with multiple cutting units, take care when rotating a cutting unit; it can cause the reels in the other cutting units to rotate.

Replacing the Blades

Service Interval: Yearly—Replace the blades.

To maintain balance, replace blades only as an opposed pair or a whole rotor at a time. Also replace the bushing, the bolt, and the locknut when you replace a blade. There are 2 service kits available for blade replacement; refer to the *Parts Catalog*.

1. Raise the cutting units and secure them with the transport latches.
2. Engage the parking brake, shut off the engine, and remove the key.
3. If you are replacing blades on the center cutting unit, remove the entire cutting unit unless an overhead lift is available.
4. Turn the rotor slowly by hand so that each row of flails are in the desired position and you can easily access them.
5. Use the rotor locking tool (provided in the blade-sharpening kit) to lock the rotor.
6. Remove any debris from the bolt head and the nut and clean the protruding threads with a wire brush.
7. Mark the position of the bolt head so that you can replace the bolts from the same side.
8. Holding the blade in a rag or padded glove, remove the nut, bolt, bushing, and blade (Figure 77).

   Note: If needed, apply penetrating oil to the threads to make the nut easier to remove.

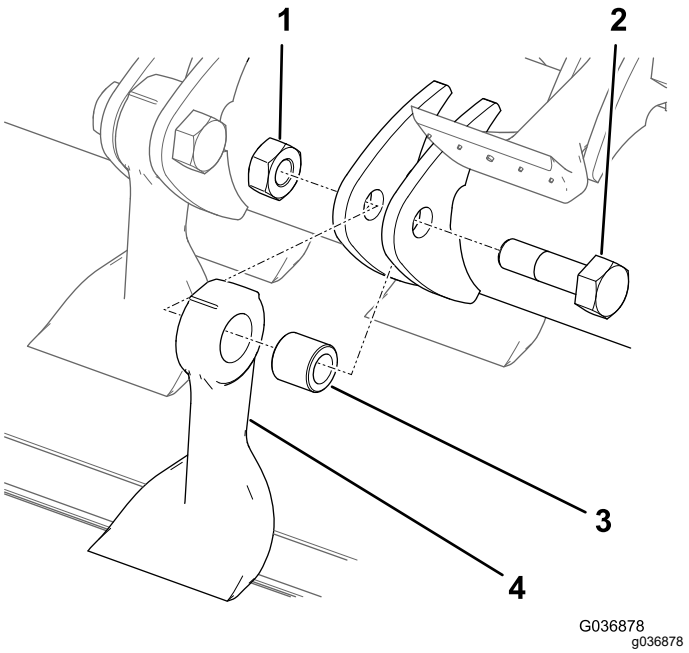


Figure 77

1. Nut
2. Bolt
3. Bushing
4. Blade

9. Discard the blade, bushing, nut, and bolt.
10. Install a new blade and bushing with a new nut and blade bolt (Figure 77).

    Note: Pay attention to the bolt-head-position markings so that you replace the bolt in the same direction.
11. Torque the fasteners to 45 N·m (33 ft-lb).

Checking the Blade Bolts

Service Interval: Every 50 hours

Make sure that all blade bolts are torqued to 45 N·m (33 ft-lb).

Inspecting the Blades

Service Interval: Every 50 hours—Inspect the blades for damage and excessive wear.

Every 50 hours—Make sure that each blade bolt is torqued to 45 N·m (33.2 ft-lb).

Important: **Blades should always be replaced at the same time as the opposite blade/as pairs to maintain balance.**

1. Park the machine on a level surface.
2. Raise and support the cutting unit with the transport latches.
3. Shut off the engine, engage the parking brake, and remove the key.
4. Inspect each blade for damage paying particular attention to the fasteners, cutting edge, and installation hole (Figure 78). Replace all damaged blades and fasteners.

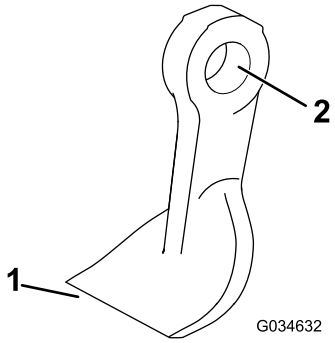


Figure 78

1. Cutting edge
2. Installation hole

5. Inspect each blade for excessive wear using the wear line (Figure 79). When a blade is worn down to the wear line, replace the blade.

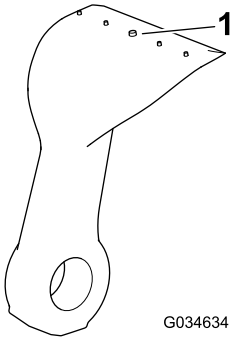


Figure 79

1. Wear line

6. Make sure that each blade bolt is torqued to 45 N·m (33.2 ft-lb).
7. Grip each blade and make sure that there is not more than a total of 3 mm (1/8 inch) of free movement in either direction from the rotor. If there is more than a total of 3 mm (1/8 inch) of free movement, replace the blade.
8. Check each pair of opposite blades for a weight difference between them.

   Note: Each pair of opposite blades should not have a weight difference of more than 10 grams.

⚠ DANGER

A worn or damaged blade can break, and a piece of the blade could be thrown toward you or bystanders, resulting in serious personal injury or death.

- **Inspect the blades periodically for wear or damage.**
- **Replace a worn or damaged blade.**

Checking the Rear Guard

Service Interval: Before each use or daily

Inspect the rear guard for wear or damage (Figure 80). Replace the rear guard if it is damaged to prevent objects being thrown into the operator's area.

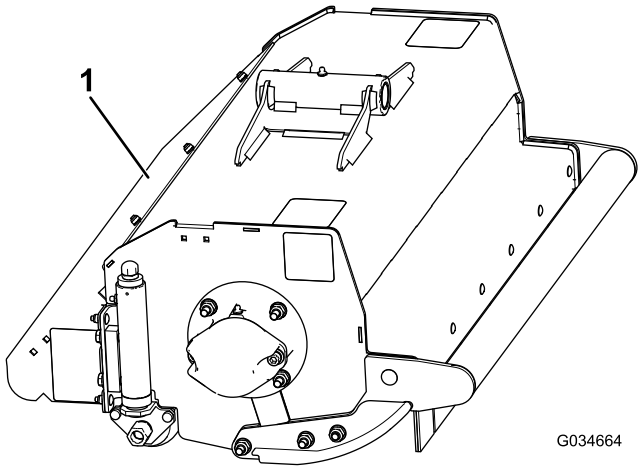


Figure 80

1. Rear guard

Clearing a Blocked Rotor

⚠ WARNING

Residual pressure in the hydraulic system could cause injury through sudden movement of the flail rotor(s) when the blockage is released.

- **Never attempt to rotate or clear blockage from the flail rotors by hand.**
- **Always wear protective gloves and use a wooden pole.**
- **Ensure that the wooden pole fits in the flail rotor and is long enough to provide sufficient leverage to release the blockage.**

1. Set the cutting-unit-drive switch to the OFF position.
2. Park the machine on level ground, release the forward or reverse travel pedals, set the throttle control to the slow engine-speed position, and engage the parking brake.
3. Lower the cutting units to the ground or securely lock them in the designated transport position.
4. Shut off the engine, remove the key, and wait for the flail rotors to stop moving.
5. Use a wooden pole to remove the blockage.

   Important: **The flail rotor may rotate when you release the blockage.**

   Important: **Support the wooden pole in the cutting unit to avoid using excessive force when you remove the blockage.**
6. Remove the wooden pole from the cutting unit before you start the engine.
7. Repair or adjust the cutting unit if necessary.

Checking the Front Guards

Service Interval: Before each use or daily

Inspect the front guards for wear or damage (Figure 81). Replace the front guards if they are damaged to prevent objects being thrown toward you.

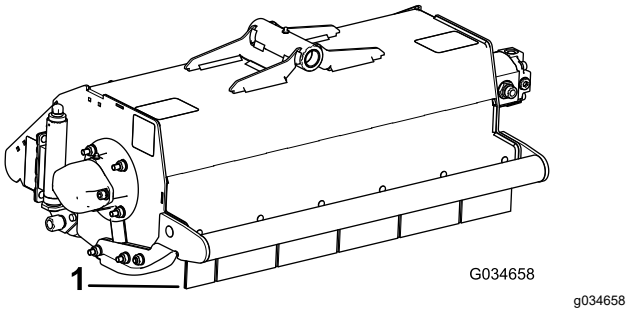


Figure 81

1. Front guard

Checking the Cutting Unit Pivot

Service Interval: Before each use or daily

Every 50 hours

1. Raise and support the cutting unit.
2. Grip each cutting unit and check for excessive play from side to side or up and down.

Checking the Rotor

Service Interval: Before each use or daily—Check for any unusual vibration of the rotor.

Every 50 hours—Check for excessive play in the rotor bearings.

To check for any unusual vibration of the rotor, run each cutting unit in turn at full engine speed.

Note: If there is any unusual vibration, check for damage or excessive wear of the rotor or blades. All blades need to have a similar level of wear as their weight affects the balance of the rotor.

Note: If you cannot resolve the vibration issue, contact your authorized Toro distributor.

1. Raise and support the cutting unit.
2. Grip the rotor at each end and check for excessive end play.

   Note: If you detect the rotor has excessive end play, contact your authorized Toro distributor.

   Note: If the rotor needs to be replaced or balanced, contact your authorized Toro distributor.

Checking the Rear-Roller Bearing Adjustment

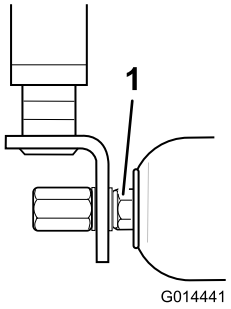
Service Interval: Every 50 hours

Important: **Keep the roller bearings on the cutting units in good adjustment to ensure maximum working life. Excessive roller-end play causes premature bearing damage.**

1. Grip the roller and move from side to side and up and down.
2. If there is excessive movement, carefully tighten the nuts at each end of the roller with the wrench just enough to remove any end play (Figure 82).

   Note: The roller should still rotate freely after adjustment. Overtightening the nuts could lead to premature bearing damage.

   Note: Adjust the nuts by an equal amount at both ends of the roller.



g014441

Figure 82

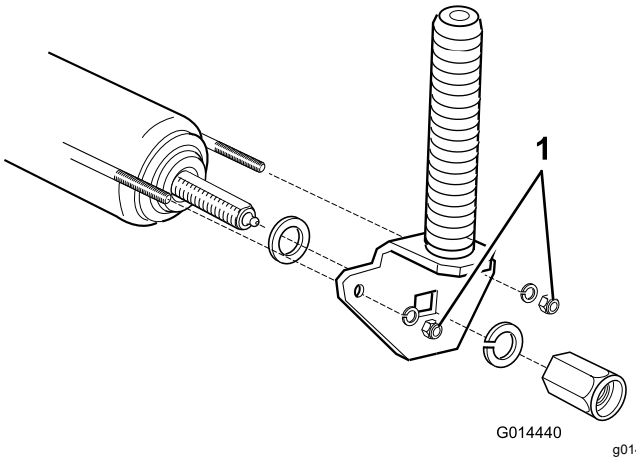
1. Nut

Checking the Rear-Roller Scraper Wire Tension

Service Interval: Every 50 hours

Ensure that the scraper wires are correctly tensioned for maximum working life.

1. Carefully tighten the scraper wire retaining nuts to remove any slack from the scraper wires.
2. Tighten the nuts 4 full turns to correctly tension the wire (Figure 83).



g014440

Figure 83

1. Scraper wire retaining nuts

Note: Do not overtighten the scraper wires.

Chassis Maintenance

Inspecting the Seat Belt

Service Interval: Before each use or daily

1. Inspect the seat belt for wear, cuts, and other damage. Replace the seat belt(s) if any component does not operate properly.
2. Clean the seat belt as necessary.

Checking the Fasteners

Service Interval: Before each use or daily

Check the machine for loose and missing fasteners.

Note: Tighten any loose fasteners; replace any missing fasteners.

Extended Maintenance

Service Interval: Every 250 hours—Inspect the cooling-system hoses.

Every 1,500 hours—Flush and replace the coolant.

Every 2 years—Replace all moving hoses.

Every 2 years—Replace the transmission cable.

Cleaning

Washing the Machine

Wash the machine as needed using water alone or with a mild detergent. You may use a rag when washing the machine.

Important: **Do not use brackish or reclaimed water to clean the machine.**

Important: **Do not use power-washing equipment to wash the machine. Power-washing equipment may damage the electrical system, loosen important decals, or wash away necessary grease at friction points. Avoid excessive use of water near the control panel, engine, and battery.**

Important: **Do not wash the machine with the engine running. Doing so may result in internal engine damage.**

Storage

Storage Safety

- Before you leave the operator's position, do the following:
  - Park the machine on a level surface.
  - Disengage and lower the cutting units.
  - Engage the parking brake.
  - Shut off the engine and remove the key.
  - Wait for all movement to stop.
  - Allow the machine to cool before adjusting, servicing, cleaning, or storing it.
- Do not store the machine or fuel container where there is an open flame, spark, or pilot light, such as on a water heater or other appliance.

Preparing the Traction Unit

1. Park the machine on a level surface, lower the cutting units, engage the parking brake, shut off the engine, and remove the key.
2. Thoroughly clean the traction unit, cutting units, and the engine.
3. Check the tire pressure; refer to Checking the Tire Air Pressure (page 52).
4. Check all fasteners for looseness; tighten them as necessary.
5. Grease or oil all grease fittings and pivot points. Wipe up 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.

Preparing the Engine

1. Drain the oil from the engine and install the drain plug.
2. Remove and discard the oil filter. Install a new oil filter.
3. Fill the engine with specified motor oil.
4. Start the engine and run it at idle speed for approximately 2 minutes.
5. Shut off the engine and remove the key.
6. Flush the fuel tank with fresh, clean fuel.
7. Secure all fuel-system fittings.
8. Thoroughly clean and service the air-cleaner assembly.
9. Seal the air-cleaner inlet and the exhaust outlet with weatherproof tape.
10. Check the antifreeze protection and add a 50/50 solution of water and ethylene glycol antifreeze as needed for the expected minimum temperature in your area.

Preparing the Electrical System

1. Service the battery and cables as follows; refer to Electrical System Safety (page 51).
2. Remove the battery terminals from the battery posts.
3. Clean the battery, terminals, and posts with a wire brush and baking-soda solution.
4. Coat the cable terminals and battery posts with Grafo 112X skin-over grease (Toro Part No. 505-47) or petroleum jelly to prevent corrosion.
5. Slowly charge the battery every 60 days for 24 hours to prevent lead sulfation of the battery.

Troubleshooting

Problem	Possible Cause	Corrective Action
There are areas of uncut grass at the overlap between cutting units.	1. You are turning too tightly. 2. The machine slides sideways when driving the machine across the face of a slope. 3. There is no ground contact on 1 end of the cutting unit because of poorly routed hoses or wrongly positioned hydraulic adapters. 4. There is no ground contact on 1 end of the cutting unit because a pivot pin is seizing. 5. There is no ground contact on 1 end of the cutting unit because of grass buildup under the cutting unit.	1. Increase the turning radius. 2. Mow up/down the slope. 3. Correct the hose routing or the position of the hydraulic adapters. 4. Release and grease the pivot points. 5. Clear the grass buildup.
There are full-width ridge lines in the cut across the direction of travel.	1. The forward speed is too high. 2. The rotor speed is too slow. 3. The height of cut is too low.	1. Reduce forward speed. 2. Increase engine speed. 3. Raise the height of cut.
There are ridge lines in the cut grass, across the direction of travel, over the cutting width of 1 cutting unit.	1. A rotor is running slow.	1. Check the rotor speed; consult your authorized distributor.
There is a step in the cut grass height at the point of overlap between cutting units.	1. There is an inconsistent height-of-cut setting on 1 cutting unit. 2. The raise/lower position control is not in the float position. 3. There is no ground contact on 1 end of the cutting unit because of poorly routed hoses or wrongly positioned hydraulic adapters. 4. There is no ground contact on 1 end of the cutting unit because of pivot pins seizing. 5. There is no ground contact on 1 end of the cutting unit because of grass buildup under the cutting unit	1. Check and adjust the height-of-cut setting. 2. Set the position control to the float position. 3. Correct the hose routing and the position of the hydraulic adapters. 4. Release and grease the pivot points. 5. Remove the grass buildup.
There are some uncut or poorly cut strands of grass.	1. A blade is stuck. 2. A blade is damaged. 3. The height of cut is too high. 4. The cutting edges of the blades are rounded.	1. Free the blade. 2. Replace the blade. 3. Lower the height of cut. 4. Replace or sharpen the blades.
There are lines of uncut or badly cut grass in the direction of travel.	1. The blades are in contact with the ground. 2. The cutting unit has a nose-down angle. 3. The cutting units are bouncing. 4. There are worn rotor bearings/bearing housing pivots. 5. There are loose components in the cutting unit.	1. Raise the height of cut. 2. Adjust the cutting unit to position the cutting unit parallel to the ground. 3. Reduce the forward speed and reduce the weight transfer. 4. Replace any worn parts. 5. Check and tighten components as necessary.
There is scalping of the turf.	1. The undulations are too severe for the height of cut setting. 2. The height of cut is too low.	1. Raise the height of cut. 2. Raise the height of cut.

Problem	Possible Cause	Corrective Action
There is excessive blade wear.	1. The blades are in heavy contact with the ground. 2. The cutting edges of the blades are rounded. 3. There are excessively abrasive ground conditions.	1. Raise the height of cut. 2. Sharpen or replace the blades. 3. Raise the height of cut.
The engine does not start with the ignition key.	1. The transmission neutral interlock switch is not energized. 2. The parking brake interlock switch is not energized. 3. The cutting unit drive interlock switch is not energized. 4. There is a malfunctioning electrical connection.	1. Remove your foot from the forward/reverse pedals or check the setting of the transmission neutral interlock switch. 2. Move the parking brake switch to the on position. 3. Move the cutting unit switch to the off position. 4. Locate and correct the fault in the electrical system.
The battery has no power.	1. A terminal connection is loose or corroded. 2. The alternator belt is loose or worn. 3. The battery is discharged. 4. There is an electrical short circuit.	1. Clean and tighten the terminal connections. Charge the battery. 2. Adjust the tension or replace the belt; refer to engine owner's manual. 3. Charge or replace the battery. 4. Locate the short circuit and fix it.
The hydraulic fluid is overheating.	1. There is a blocked screen. 2. The fluid cooler fins are dirty/blocked. 3. The engine radiator is dirty/blocked. 4. The relief valve setting is low. 5. The fluid level is low. 6. The brakes are engaged. 7. The rotors are overloaded or jammed. 8. There is a malfunctioning fan or fan drive.	1. Clean the screen. 2. Clean the fins. 3. Clean the radiator. 4. Have the relief valve pressure checked. Consult your authorized distributor. 5. Fill the reservoir to the correct level. 6. Disengage the brakes. 7. Free the rotors. 8. Check the fan operation and service it as required.
The brake system does not operate correctly.	1. There is a malfunctioning wheel motor brake assembly. 2. The brake discs are worn.	1. Consult your authorized distributor. 2. Replace the brake discs; consult your authorized distributor.
There is a lack of steering.	1. The steering valve is malfunctioning. 2. A hydraulic cylinder is malfunctioning. 3. A steering hose is damaged.	1. Service or replace the steering valve. 2. Service or replace the hydraulic cylinder. 3. Replace the hose.
There is no machine movement in forward or reverse.	1. The parking brake is engaged. 2. The fluid level is low. 3. The reservoir has the wrong kind of fluid. 4. The drive pedal linkage is damaged. 5. The transmission pump is damaged. 6. The transmission bypass valve is open. 7. There is a broken drive coupling.	1. Disengage the parking brake. 2. Fill the reservoir to the correct level. 3. Drain the reservoir and fill it with the correct fluid. 4. Check the linkage and replace any damaged or worn parts. 5. Have the transmission pump overhauled by your authorized distributor. 6. Close the bypass valve. 7. Replace the drive coupling.
The machine creeps forward or backward in neutral.	1. The transmission neutral adjustment is set incorrectly.	1. Adjust the transmission neutral linkage setting.

Problem	Possible Cause	Corrective Action
There is excessive noise in the hydraulic system.	1. A pump is malfunctioning.	1. Identify the noisy pump and service or replace it.
	2. A motor is malfunctioning.	2. Identify the noisy motor and service or replace it.
	3. Air is leaking into the system.	3. Tighten or replace the hydraulic fittings, particularly in the suction lines.
	4. A suction strainer is blocked or damaged.	4. Clean and replace the suction strainer or renew it as necessary.
	5. The fluid has excessive viscosity due to cold conditions.	5. Allow the system to warm up.
	6. The relief valve setting is low.	6. Have the relief valve pressure checked. Consult your authorized distributor.
	7. The hydraulic fluid level is low.	7. Fill the hydraulic fluid reservoir to the correct level.
After an initial period of satisfactory operation, the machine loses power.	1. A pump or motor is worn.	1. Replace parts as necessary.
	2. The hydraulic fluid level is low.	2. Fill hydraulic fluid tank to the correct level
	3. The fluid in the hydraulic system has the wrong viscosity.	3. Replace the fluid in the hydraulic tank with the correct viscosity-grade fluid; refer to the Specifications section.
	4. The fluid-filter element is blocked.	4. Change the filter element.
	5. The pressure relief valve is malfunctioning.	5. Have the relief valve cleaned and pressure checked. Consult your authorized distributor.
	6. The system is overheating.	6. Check the reel-to-bedknife adjustment. Reduce the work rate (increase the height of cut or reduce the forward speed).
	7. There are leaks on the suction hose.	7. Check and tighten the fittings. Replace the hose if necessary.
The rotors vibrate excessively.	1. The blades are loose, worn, missing, or damaged. Opposite blades need to be the same weight.	1. Sharpen or replace the blades.
	2. The rotor bearings are worn.	2. Replace the bearings as necessary.
1 rotor rotates slowly.	1. A rotor bearing is seized.	1. Replace the bearings as necessary.
	2. A motor with incorrect rotation was installed.	2. Check the motor and replace it if necessary.
	3. The motor integral relief valves are jammed open.	3. Have the relief valves cleaned and checked.
	4. The motor is worn.	4. Replace the motor.
A cutting unit fails to lift out of work.	1. There is a lift cylinder seal failure.	1. Replace the seals.
	2. The pressure relief valve is jammed open or wrongly set.	2. Have the relief valve pressure checked. Consult your authorized distributor.
	3. There is a malfunctioning control valve.	3. Overhaul the control valve.
	4. There is mechanical blockage.	4. Remove the blockage.
The cutting units do not follow the contours of the ground.	1. The hose routing or the orientation of the hydraulic fittings is incorrect.	1. Move the cutting units throughout the extremes of movement and observe any tightness in the hoses. Correctly route the hoses and orientate the fittings as necessary.
	2. The pivot points are too tight.	2. Release and grease the pivot point as necessary.
	3. The cutting unit operating in the ‘hold’ position.	3. Move the position control switch to ‘down / float’ position.
	4. The weight transfer is set too high.	4. Reduce the weight transfer.

Problem	Possible Cause	Corrective Action
The cutting units fail to start up when lowered into work.	1. The seat sensor switch is malfunctioning.	1. Check the mechanical and electrical operation of the switch.
	2. The hydraulic-fluid level is low.	2. Fill the hydraulic-fluid reservoir to the correct level.
	3. A driveshaft is sheared.	3. Check the motor and rotor driveshafts and replace them if necessary.
	4. The pressure relief valve is jammed open or wrongly set.	4. Have the relief valve pressure checked. Consult your authorized dealer.
	5. A cutting unit is jammed.	5. Clear any jams as necessary.
	6. A cutting unit control valve is in the OFF position, caused by malfunctioning control valve.	6. Overhaul the control valve.
	7. A cutting unit control valve is in the OFF position, caused by an electrical fault.	7. Have the electrical system checked for an electrical fault.
	8. The lift arm proximity switch is incorrectly set.	8. Check and adjust the proximity switch.
The rotor rotates in the wrong direction.	1. The hoses are connected wrongly.	1. Check the hydraulic circuit and connect the hoses correctly.

Notes:

The Toro Warranty

Two-Year or 1,500 Hours Limited Warranty

Conditions and Products Covered

The Toro Company warrants your Toro Commercial product (“Product”) to be free from defects in materials or workmanship for 2 years or 1,500 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
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*. Repairs for product issues caused by failure to perform required maintenance and adjustments are not covered under this warranty.

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.
- Product failures which result from failure to perform recommended maintenance and/or adjustments.
- Product failures which result from operating the Product in an abusive, negligent, or reckless manner.
- Parts consumed through use that are not 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, flow meters, and check valves.
- Failures caused by outside influence, including, but not limited to, weather, storage practices, contamination, use of unapproved fuels, coolants, lubricants, additives, fertilizers, water, or chemicals.
- 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.

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.
Note: (Lithium-Ion battery only): Refer to the battery warranty for additional information.

Lifetime Crankshaft Warranty (ProStripe 02657 Model Only)

The Prostripe which is fitted with a genuine Toro Friction Disc and Crank-Safe Blade Brake Clutch (integrated Blade Brake Clutch (BBC) + Friction Disc assembly) as original equipment and used by the original purchaser in accordance with recommended operating and maintenance procedures, are covered by a Lifetime Warranty against engine crankshaft bending. Machines fitted with friction washers, Blade Brake Clutch (BBC) units and other such devices are not covered by the Lifetime Crankshaft Warranty.

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.

The Toro Company is not 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 Emissions 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.

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 your Authorized Toro Service Center.



Count on it.