



Count on it.

Operator's Manual

**Groundsmaster® 360 2-Wheel
Drive Multi-Purpose Machine**

Model No. 31230—Serial No. 316000001 and Up



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

⚠ WARNING

**CALIFORNIA
Proposition 65 Warning**

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

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

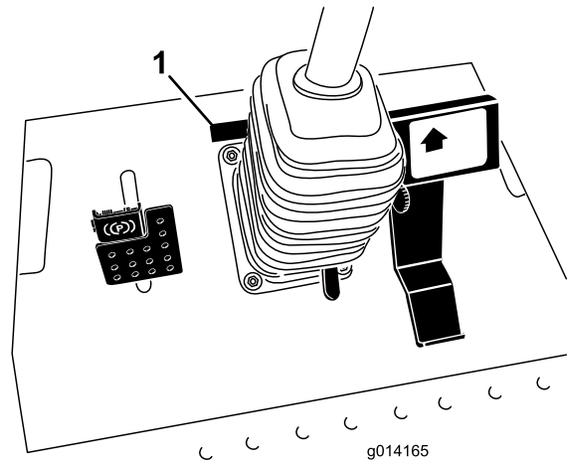


Figure 1

1. Model and serial number location

Model No. _____

Serial No. _____

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

Introduction

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

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

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

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

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



Figure 2

1. Safety-alert symbol

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

Contents

Safety	4	Electrical System Maintenance	34
General Safety.....	4	Electrical System Safety.....	34
Vibration Level	4	Checking the Fuses.....	34
Safety and Instructional Decals	4	Servicing the Battery.....	35
Setup	9	Storing the Battery.....	35
1 Adjusting the ROPS	9	Drive System Maintenance	36
2 Checking the Tire Pressure.....	9	Checking the Tire Pressure	36
3 Checking the Fluid Levels	10	Cooling System Maintenance	36
Product Overview	10	Cooling System Safety.....	36
Controls	10	Checking the Cooling System	36
Specifications	12	Brake Maintenance	37
Attachments/Accessories.....	12	Adjusting the Service Brakes	37
Before Operation	12	Adjusting the Parking Brake	37
Before Operation Safety.....	12	Belt Maintenance	38
Filling the Fuel Tank	13	Checking the Alternator Belt	38
Positioning the Standard Seat	14	Controls System Maintenance	39
Positioning the Deluxe Seat.....	15	Adjusting the Traction Drive for Neutral.....	39
Raising and Lowering the Seat	16	Adjusting the Maximum Ground Speed	39
During Operation	16	Hydraulic System Maintenance	40
During Operation Safety	16	Hydraulic System Safety	40
Think Safety First.....	17	Checking the Hydraulic System	40
Using the Rollover-Protection System (ROPS).....	17	Changing the Hydraulic Fluid and Filter	41
Starting and Shutting off the Engine.....	18	Storage	42
Driving the Machine	19	Servicing the Engine.....	42
Stopping the Machine	19	Servicing the Machine.....	42
The Safety-Interlock System	19		
Understanding the Diagnostic Light.....	20		
Diagnostic Ace Display	20		
Checking the Interlock Switches	21		
Operating the Mower.....	22		
Operating Tips	23		
After Operation	23		
After Operation Safety	23		
Pushing the Machine by Hand	23		
Hauling the Machine.....	24		
Maintenance	25		
Recommended Maintenance Schedule(s)	25		
Daily Maintenance Checklist	26		
Pre-maintenance Procedures	27		
Pre-Maintenance Safety.....	27		
Preparing the Machine for Maintenance.....	27		
Using the Hood-Prop Rod.....	28		
Lubrication	28		
Greasing the Bearings and Bushings	28		
Engine Maintenance	30		
Engine Safety.....	30		
Servicing the Air Cleaner	30		
Checking the Engine-Oil Level.....	30		
Changing the Engine Oil and Filter	31		
Adjusting the Throttle.....	32		
Fuel System Maintenance	32		
Servicing the Water Separator	32		
Bleeding the Fuel System.....	33		
Bleeding Air from the Fuel Injectors.....	33		
Cleaning the Fuel Tank.....	33		
Checking the Fuel Lines and Connections	34		

Safety

This machine has been designed in accordance with EN ISO 5395:2013 and ANSI B71.4-2012.

General Safety

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

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

- Read and understand the contents of this *Operator's Manual* before you start the engine. Ensure that everyone using this product knows how to use it and understands the warnings.
- Do not put your hands or feet near moving components of the machine.
- Do not operate the machine without all guards and other safety protective devices in place and working on the machine.
- Keep clear of any discharge opening. Keep bystanders a safe distance from the machine.
- Keep children out of the operating area. Never allow children to operate the machine.
- Stop the machine and shut off the engine before servicing, fueling, or unclogging the machine.

Safety and Instructional Decals

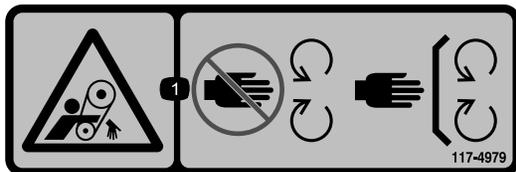


Safety decals and instructions are easily visible to the operator and are located near any area of potential danger. Replace any decal that is damaged or lost.



93-6696

1. Stored energy hazard—read the *Operator's Manual*.



117-4979

1. Rotating belt — Keep guard in place

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

You can find additional items of safety information in their respective sections throughout this manual.

Vibration Level

CE Model Only

Hand-Arm

Measured vibration level for right hand = 0.39 m/s^2

Measured vibration level for left hand = 0.34 m/s^2

Uncertainty Value (K) = 0.5 m/s^2

Measured values were determined according to the procedures outlined in EN ISO 5395:2013.

Whole Body

Measured vibration level = 0.54 m/s^2

Uncertainty Value (K) = 0.5 m/s^2

Measured values were determined according to the procedures outlined in EN ISO 5395:2013.



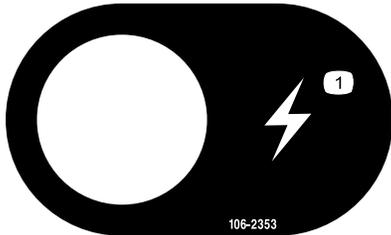
117-3276

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



117-3272

1. Warning—read the *Operator's Manual*; failure to use the rollover-protection system (ROPS) can result in injury in the event of a rollover; wear a seat belt when a ROPS is in place; do not wear a seat belt when ROPS is lowered.



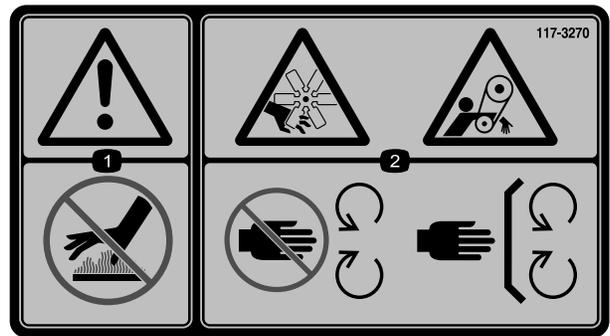
106-2353

1. Electrical-power point



117-4766

1. Cutting/dismemberment hazard; fan—stay away from moving parts, keep all guards and shields in place.



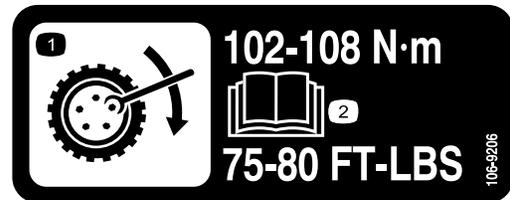
117-3270

1. Warning—do not touch the hot surface.
2. Cutting/dismemberment hazard, hand; entanglement hazard, belt—stay away from moving parts, keep all guards and shields in place.

CALIFORNIA SPARK ARRESTER WARNING

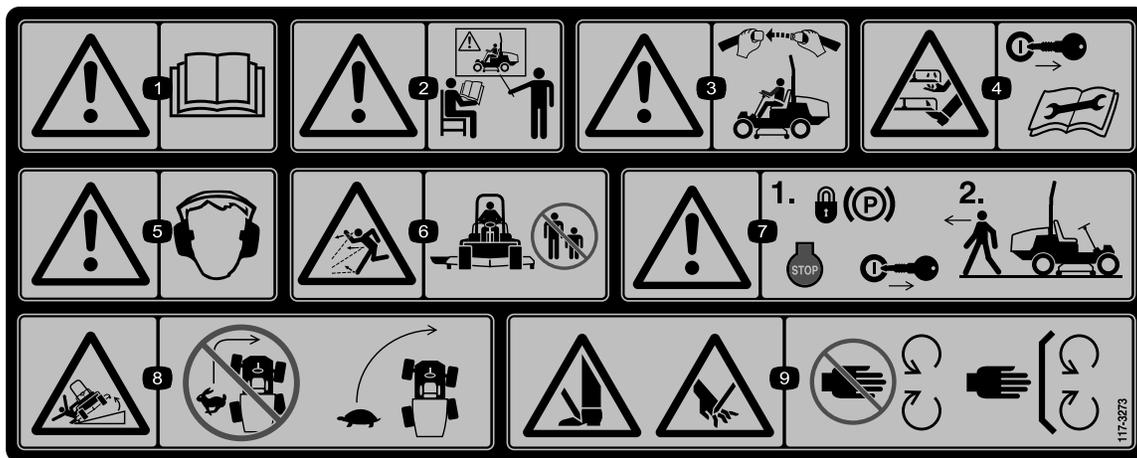
Operation of this equipment may create sparks that can start fires around dry vegetation. A spark arrester may be required. The operator should contact local fire agencies for laws or regulations relating to fire prevention requirements. 117-2718

117-2718



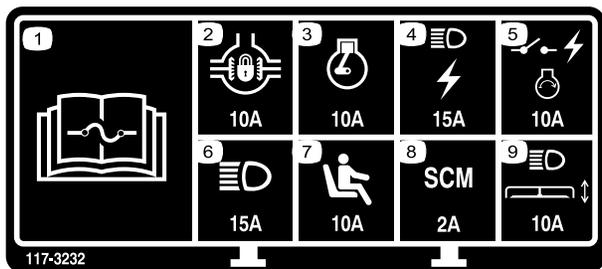
106-9206

1. Wheel torque specifications
2. Read the *Operator's Manual*.



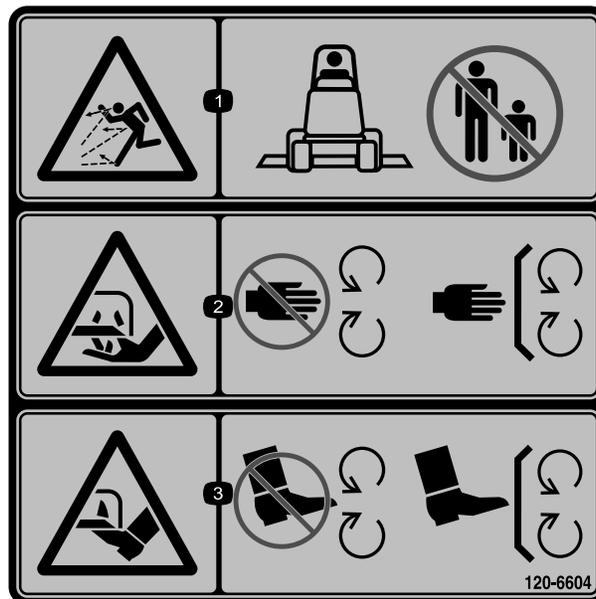
117-3273

1. Warning—read the *Operator's Manual*.
2. Warning—do not operate this machine unless you are trained.
3. Warning—wear the seat belt when seated in the operator's position.
4. Cutting/dismemberment hazard of hand or foot—remove the ignition key and read the instructions before servicing or performing maintenance.
5. Warning—wear hearing protection.
6. Thrown object hazard—keep bystanders a safe distance from the machine.
7. Warning—lock the parking brake, stop the engine, and remove the ignition key before leaving the machine.
8. Tipping hazard—lower the cutting unit when driving down slopes; slow the machine before turning, do not turn at high speeds.
9. Cutting hazard of hand or foot—stay away from moving parts; keep all guards in place.



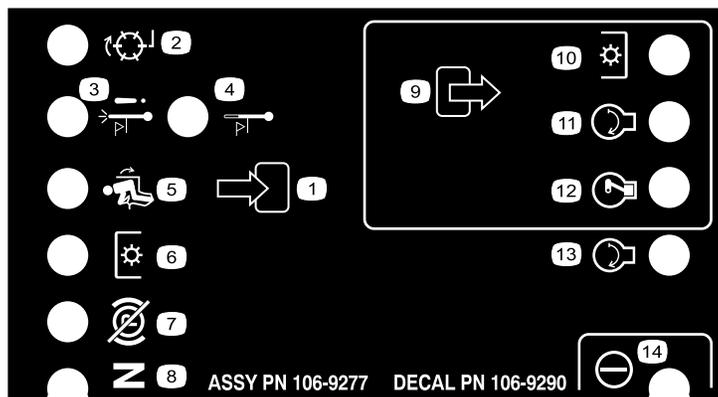
117-3232

1. Read the *Operator's Manual* for information on fuses.
2. Differential lockout—10 A
3. Engine—10 A
4. Lights, power point—15 A
5. Power switch, engine ignition—10 A
6. Lights—15 A
7. Operator presence switch—10 A
8. Computer—2 A
9. Headlights, deck actuator—10 A



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.



106-9290

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

GROUNDMASTER 360 QUICK REFERENCE AID

CHECK/SERVICE (daily)

1. OIL LEVEL, ENGINE	6. RADIATOR SCREEN
2. OIL LEVEL, HYDRAULIC TANK	7. BRAKE FUNCTION
3. COOLANT LEVEL, RADIATOR	8. TIRE PRESSURE
4. FUEL /WATER SEPARATOR	9. BATTERY
5. PRECLEANER - AIR CLEANER	10. BELTS - DECK, FAN, ALTERNATOR
	11. GEARBOX

GREASING - SEE OPERATOR'S MANUAL

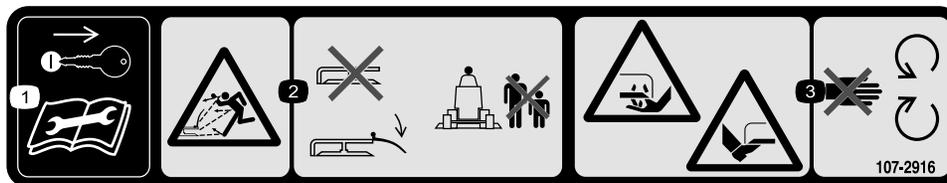
FLUID SPECIFICATIONS/CHANGE INTERVALS

SEE OPERATOR'S MANUAL FOR INITIAL CHANGES.	FLUID TYPE	CAPACITY	CHANGE INTERVAL*		FILTER PART NO.
			FLUID	FILTER	
A. ENGINE OIL	4 CYL-1.5L	5.5 QTS. (5.2 LITERS)	150 HRS.	150 HRS.	108-3841
	3 CYL-1.1L	4.9 QTS. (4.7 LITERS)			
B. HYDRAULIC CIRCUIT OIL	MOBIL 424	4.5 GALS. (17 LITERS)	800 HRS.	800 HRS.	108-5194
C. AIR CLEANER				SEE INDICATOR	108-3810
D. WATER SEPARATOR			400 HRS.		110-9049
E. FUEL TANK	NO. 2-Diesel	13.5 GALS. (51.1 LITERS)	Drain and flush, 2 yrs.		
F. COOLANT	50/50 Ethylene glycol/water	8 QTS. (7.5 LITERS)	Drain and flush, 2 yrs.		
G. GEARBOX	SAE EP90W	12 oz. (355 mL)	400 HRS.		

*SEE OPERATOR'S MANUAL FOR INITIAL CHANGES / WINTER USE.

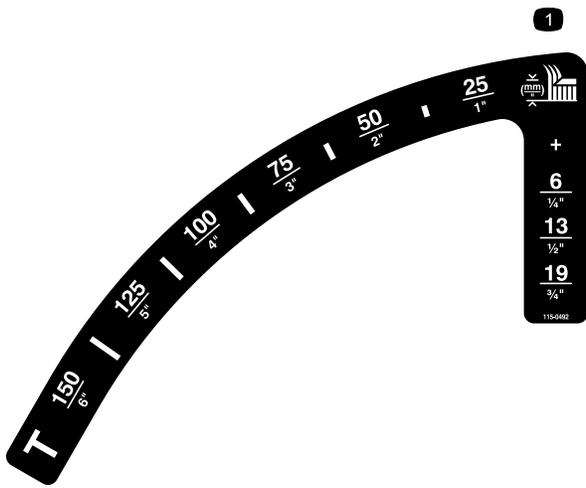
120-0259

120-0259



107-2916

1. Remove the ignition key and read the *Operator's Manual* before servicing or performing maintenance.
2. Thrown object hazard—do not operate the mower with the deflector up or removed, keep the deflector in place; keep bystanders a safe distance from the machine.
3. Cutting/dismemberment hazard of hand or foot, mower blade—stay away from moving parts.



115-0492

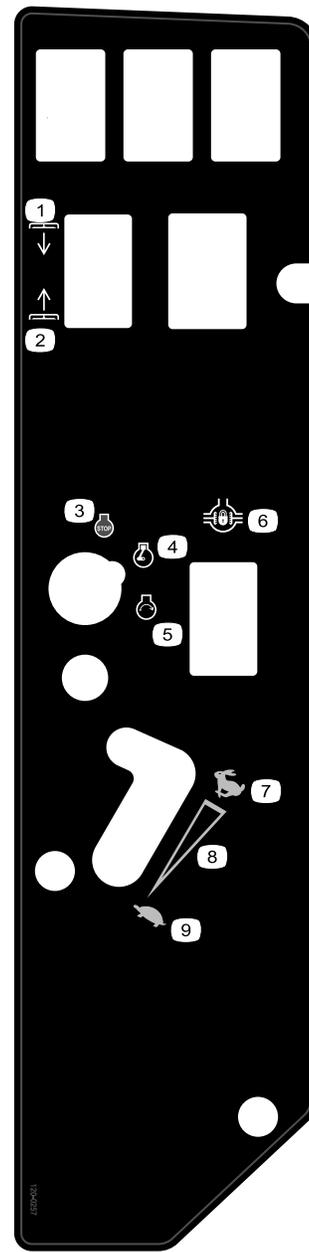
1. Height of cut (mm)



Battery Symbols

Some or all of these symbols are on your battery.

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



120-0257

- | | |
|-----------------|--------------------------------|
| 1. Lower decks | 6. Differential lock |
| 2. Raise decks | 7. Fast |
| 3. Engine—stop | 8. Continuous variable setting |
| 4. Engine—run | 9. Slow |
| 5. Engine—start | |

Setup

Loose Parts

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

Procedure	Description	Qty.	Use
1	No parts required	–	Adjust the ROPS.
2	No parts required	–	Check the tire pressure.
3	No parts required	–	Check the hydraulic fluid, engine oil, and coolant levels.

Media and Additional Parts

Description	Qty.	Use
Operator's Manual	1	Read before operating the machine
Engine operator's manual	1	Read before operating the machine
Parts Catalog	1	Use to reference part numbers
Operator training materials	1	View the video before operating the machine.

1

Adjusting the ROPS

No Parts Required

Procedure

1. Remove the hairpin cotters and the pins from the roll bar (Figure 3).
2. Raise the roll bar to the upright position and install the 2 pins and secure them with the hairpin cotters (Figure 3).

Note: If you must lower the roll bar, push the bar forward to relieve pressure on the pins, remove the pins, lower the bar slowly, and secure it with the pins so that it does not damage the hood.

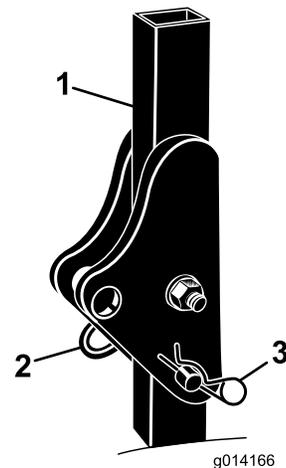


Figure 3

1. Roll bar
2. Pin
3. Hairpin cotter

2

Checking the Tire Pressure

No Parts Required

Procedure

The tires are over-inflated for shipping. Therefore, release some of the air to reduce the pressure. The correct air pressure for non-cab models is 103 kPa (15 psi) in the front tires and 172 kPa (25 psi) in the rear tires. If a cab is on the machine, the front and rear tires should be inflated to 172 kPa (25 psi).

3

Checking the Fluid Levels

No Parts Required

Procedure

1. Check the hydraulic-fluid level before starting the engine; refer to [Checking the Hydraulic System \(page 40\)](#).
2. Check the engine-oil level before starting the engine; refer to [Checking the Engine-Oil Level \(page 30\)](#).
3. Check the cooling system before starting the engine; refer to [Checking the Cooling System \(page 36\)](#).

Product Overview

Controls

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

Traction Pedal

The traction pedal ([Figure 4](#)) controls the forward and reverse operation. Press the top of the pedal to move forward and the bottom to move rearward. The ground speed depends on how far you press the pedal. For no load, maximum ground speed, fully press the pedal while the throttle is in the FAST position.

To stop the machine, reduce the foot pressure on the traction pedal and allow it to return to the center position.

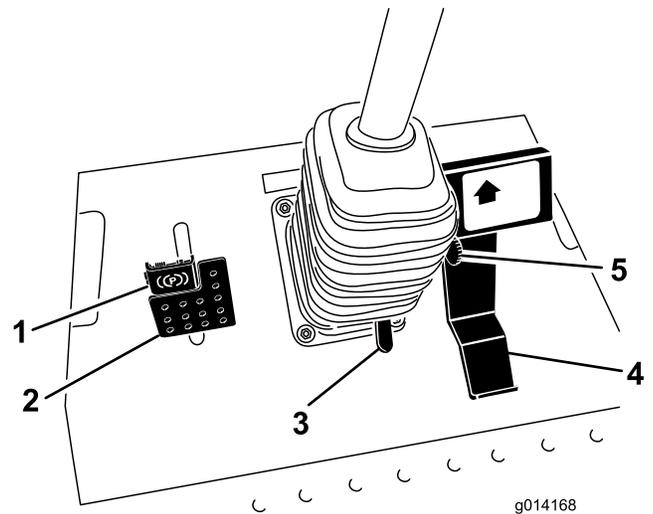


Figure 4

- | | |
|------------------------|----------------------|
| 1. Parking brake | 4. Traction pedal |
| 2. Brake pedal | 5. Mow-speed limiter |
| 3. Tilt-steering pedal | |

Brake Pedal

Use the brake pedal with the brake-pedal latch to engage and disengage the parking brake ([Figure 4](#)). To stop the machine, release the traction pedal and allow it to return to the center position. You can use the brake to assist in stopping the machine in an emergency situation.

Parking Brake

To engage the parking brake, push down on the brake pedal and press the top forward to latch it ([Figure 4](#)). To release the parking brake, press the brake pedal until the parking-brake latch retracts.

Tilt Steering Pedal

To tilt the steering wheel toward you, press the foot pedal down, pull the steering tower toward you to the most comfortable position, and release the pedal (Figure 4).

Ignition Switch

The ignition switch has 3 positions: OFF, ON/PREHEAT, and START (Figure 5).

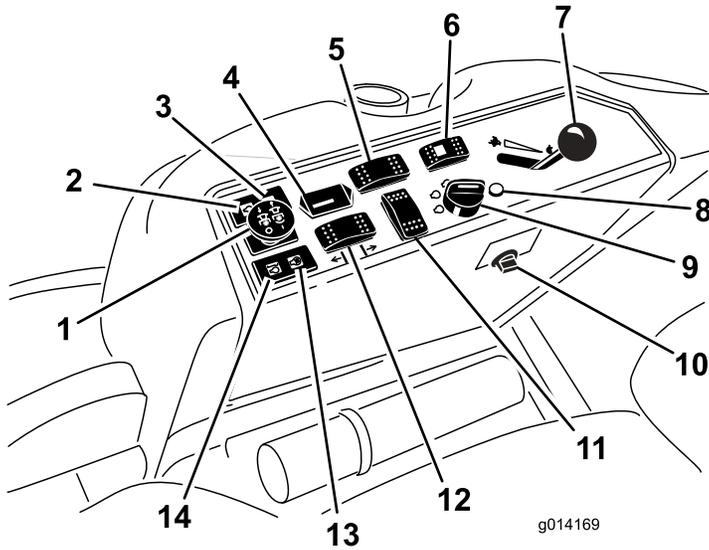


Figure 5

- | | |
|--|---|
| 1. Power-takeoff (PTO) switch | 8. Diagnostic light switch (4-wheel-drive only) |
| 2. Oil-pressure-warning light | 9. Ignition switch |
| 3. Charge-indicator light | 10. Power point |
| 4. Hour meter | 11. Optional switch location |
| 5. Differential-lock switch (2-wheel-drive only) | 12. Deck-lift switch |
| 6. Steering-selector switch (4-wheel-drive only) | 13. Glow-plug light |
| 7. Throttle lever | 14. Coolant-temperature-warning light |

Throttle Lever

The throttle lever (Figure 5) controls the engine speed. Moving the throttle lever forward toward the FAST position increases the engine speed. Moving it rearward toward the SLOW position decreases the engine speed. The throttle controls the speed of the blades and, with the traction pedal, controls the ground speed of the machine. Always run the machine with the throttle in the FAST position when cutting grass.

Power-Takeoff (PTO) Switch

The power-takeoff (PTO) switch starts and stops the mower blades (Figure 5).

Hour Meter

The hour meter (Figure 5) records the number of hours that the engine has operated. It operates when the key switch is in the RUN position. Use these times for scheduling regular maintenance.

Differential-Lock Switch

Press the front of the switch and hold it down to engage the differential lock (Figure 5).

Glow-Plug-Indicator Light (Orange Light)

The glow-plug-indicator light (Figure 5) turns on when you turn the ignition switch to the ON position. It remains on for 6 seconds. When the light turns off, you can start the engine.

Engine-Coolant-Temperature-Warning Light

This light glows and the attachment stops if the temperature of the engine coolant is high (Figure 5). If you do not stop the machine and the coolant temperature rises another 7°C (20°F), the engine shuts off.

Important: If the attachment shuts down and the temperature-warning light is on, push the PTO knob down, drive the machine to a safe, flat area, move the throttle lever to the SLOW position, allow the traction pedal to move to the NEUTRAL position, and engage the parking brake. Allow the engine to idle for several minutes while it cools to a safe level. Shut off the engine and check the cooling system; refer to [Checking the Cooling System \(page 36\)](#).

Charge Indicator

The charge indicator illuminates when the charging-system circuit malfunctions (Figure 5).

Oil-Pressure-Warning Light

The oil-pressure-warning light (Figure 5) glows when the oil pressure in engine drops below a safe level. If low oil pressure ever occurs, shut off the engine and determine the cause. Repair the damage before starting the engine again.

Fuel Gauge

The fuel gauge (Figure 6) indicates the amount of fuel remaining in the fuel tank.

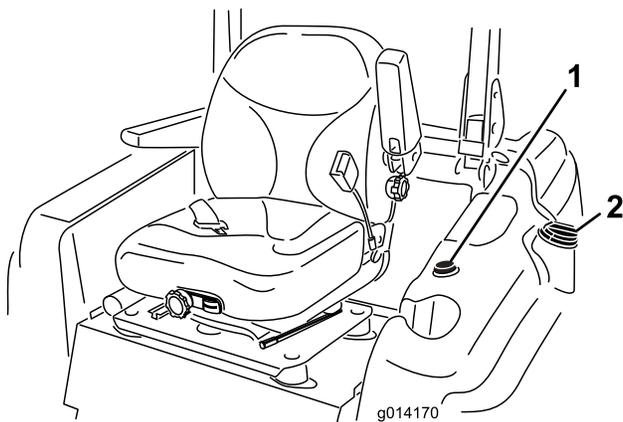


Figure 6

1. Fuel gauge

2. Fuel-tank cap

Specifications

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

Length	241.3 cm (95 inches)
Width (Rear Wheels)	144.8 cm (78 inches)
Height	
With Roll Bar up	144.8 cm (78 inches)
With Roll Bar down	54 inches (137.2 cm)
Weight	
Model 31230 with 60-inch base deck (Model 30457)	2,776 lb
Model 31230 with 60-inch side-discharge deck (Model 30456)	2,806 lb
Model 31230 with 72-inch base deck (Model 30353)	2,814 lb
Model 31230 with 72-inch side-discharge deck (Model 30354 or 30481)	2,862 lb

Attachments/Accessories

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

Operation

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

Before Operation

Before Operation Safety

General Safety

- Never allow children or untrained people to operate or service the machine. Local regulations may restrict the age of the operator. The owner is responsible for training all operators and mechanics.
- Become familiar with the safe operation of the equipment, operator controls, and safety signs. Know how to stop the machine and engine quickly.
- Check that all safety devices are attached and functioning properly. This includes, but is not limited to, operator-presence controls; safety switches and shields; the rollover protection system (ROPS); attachments; and brakes. Do not operate the machine unless all safety devices are in position and functioning as intended by the manufacturer.
- Always inspect the machine to ensure that the blades, blade bolts, and cutting assembly are not worn or damaged. Replace worn or damaged blades and bolts in sets to preserve balance.
- Inspect the area where you will use the machine and remove all objects that the machine could potentially throw.
- Evaluate the terrain to determine the appropriate equipment and any attachments or accessories required to operate the machine properly and safely.

Fuel Safety

▲ DANGER

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

- Fill the fuel tank outdoors, in an open area, when the engine is cold. Wipe up any fuel that spills.
- Never fill the fuel tank inside an enclosed trailer.
- Never smoke when handling fuel, and stay away from an open flame or where fuel fumes may be ignited by a spark.
- Store fuel in an approved container and keep it out of the reach of children. Never buy more than a 180-day supply of fuel.
- Do not operate the machine without the entire exhaust system in place and in proper working condition.

▲ WARNING

Fuel is harmful or fatal if swallowed. Long-term exposure to vapors can cause serious injury and illness.

- Avoid prolonged breathing of vapors.
- Keep your hands and face away from the nozzle and the fuel-tank opening.
- Keep fuel away from your eyes and skin.
- Use only an approved fuel container.
- Never remove the fuel cap or add fuel to the fuel tank while the engine is running.
- Never fill containers inside a vehicle or on a truck or trailer bed with a plastic liner. Always place containers on the ground and away from your vehicle before filling.
- Remove the equipment from the truck or trailer and add fuel to it while it is on the ground. If this is not possible, then add fuel using a portable container rather than from a fuel-dispenser nozzle.
- Keep the fuel-dispenser nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete. Do not use a nozzle lock-open device.
- If you spill fuel on your clothing, change your clothing immediately.
- Fill the fuel tank until the fuel level is 25 mm (1 inch) below the bottom of the filler neck. Do not overfill the fuel tank. Replace the fuel-tank cap and tighten it securely.

Filling the Fuel Tank

Recommended Fuel

Use only clean, fresh diesel fuel or biodiesel fuels with low (<500 ppm) or ultra low (<15 ppm) sulfur content. The minimum cetane rating should be 40. Purchase fuel in quantities that you can use within 180 days to ensure that the fuel is fresh.

Fuel Tank Capacity: 51 L (13.5 US gallons)

Use summer-grade diesel fuel (No. 2-D) at temperatures above -7°C (20°F) and winter grade (No. 1-D or No. 1-D/2-D blend) below that temperature. Using winter-grade fuel at lower temperatures provide a lower flash point and cold-flow characteristics, which eases starting and reduces plugging of the fuel filter.

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

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

Biodiesel Ready

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

- The biodiesel portion of the fuel must meet specification ASTM D6751 or EN14214.
- The blended fuel composition should meet ASTM D975 or EN590.
- Biodiesel blends may damage painted surfaces.
- Use B5 (biodiesel content of 5%) or lesser blends in cold weather.
- Check all seals, hoses, and gaskets in contact with fuel as they may degrade over time.
- Expect the fuel filter to plug up for a time after converting to biodiesel-blended fuel.
- Contact your distributor for more information on biodiesel fuel.

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

1. Park the machine on a level surface.
2. Shut off the engine and set the parking brake.
3. Clean around the fuel-tank cap and remove the cap (Figure 7).

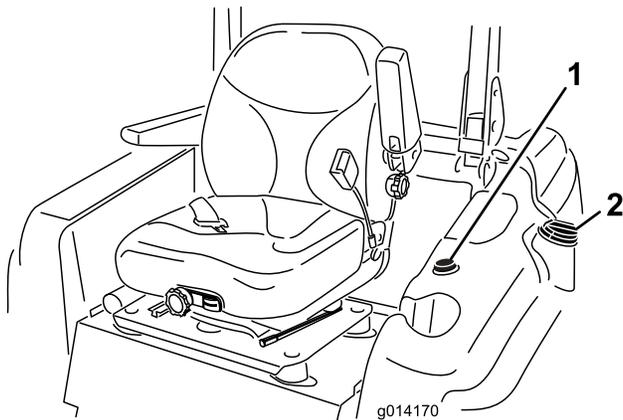


Figure 7

1. Fuel gauge
2. Fuel-tank cap

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

4. Add fuel to the fuel tank until the level is even with the bottom of the filler neck. Do not overfill the fuel tank.
5. Install the fuel-tank cap and secure. Wipe up any spilled fuel.

Positioning the Standard Seat

Changing the Seat Position

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

1. To adjust the seat, move the lever sideways to unlock the seat (Figure 8).

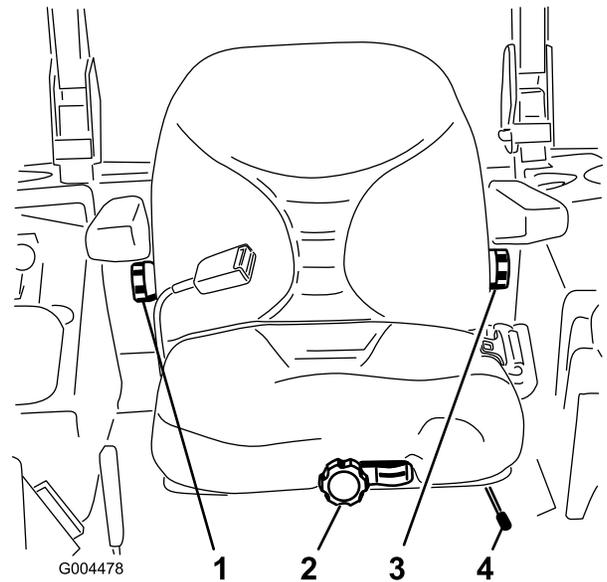


Figure 8

- | | |
|-------------------------|-----------------------------------|
| 1. Backrest knob | 3. Lumbar-support-adjustment knob |
| 2. Seat-suspension knob | 4. Seat-position-adjustment lever |
2. Slide the seat to the desired position and release the lever to lock the seat in position.
 3. Verify that the seat has locked into place by attempting to move it back and forth.

Changing the Seat Suspension

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

Without sitting on the seat, turn the knob in front in either direction to provide the best comfort (Figure 9).

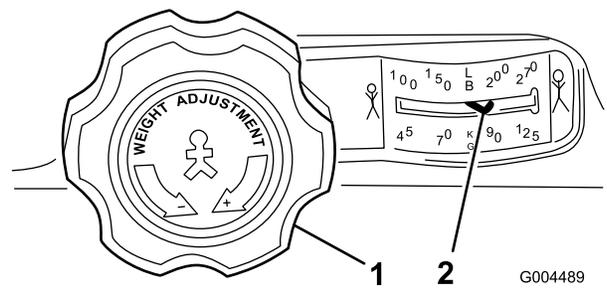


Figure 9

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

Changing the Back Position

You can adjust the back of the seat to provide a comfortable ride. Position the back of the seat where it is most comfortable.

To adjust the back of the seat, turn the knob, located under the right-side armrest, in either direction to provide the best comfort (Figure 8).

Changing the Lumbar Support

You can adjust the back of the seat to provide a customized lumbar support for your lower back.

To adjust the back of the seat, turn the knob, under the left-side armrest, in either direction to provide the best comfort (Figure 8).

Positioning the Deluxe Seat

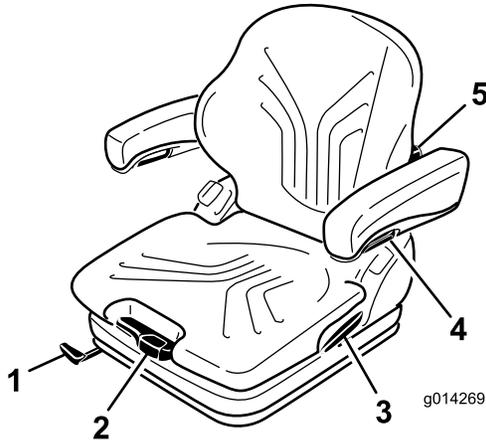


Figure 10

- | | |
|---------------------------------------|----------------------------------|
| 1. Forward-/Rearward-adjustment lever | 4. Armrest-adjustment knob |
| 2. Weight-adjustment lever | 5. Lumbar-support-adjusting knob |
| 3. Backrest-locking lever | |

Changing the Weight Adjustment

You can adjust the seat to provide a smooth and comfortable ride.

Important: To adjust the seat for your weight, you must sit in the seat and move the ignition key to the ON position.

Adjust the seat for your weight by pulling or pressing the weight-adjustment lever (Figure 10).

Your weight is adjusted correctly when the arrow is in the middle clear area of the viewing window.

Within this viewing area, you can adjust the seat to minimize the spring movement.

When you have set the minimum/maximum weight adjustment, you can hear it reaching the upper or lower end stop.

Important: To prevent injury to you or damage to the machine, check the setting for your weight and the seat and adjusted it before you operate the machine.

Note: To avoid damaging the compressor during the weight adjustment, do not operate the compressor longer than 1 minute.

Changing the Seat Position

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

1. Lift the lever to unlock the seat (Figure 10).
2. Slide the seat to the desired position and release lever to lock it into position.
3. Verify that the seat has locked into place by attempting to move it back and forth.

Note: Do not operate the locking lever while operating the machine.

Changing the Lumbar Support

The lumbar support increases both your seating comfort and performance.

You can adjust the back of the seat to provide a customized lumbar support for your lower back.

By turning the adjustment knob upward, you can adjust the curvature in the upper part of the backrest cushion. By turning the knob downwards you can adjust the curvature in the lower part of the backrest cushion (Figure 10).

0 = No curvature

1 = Maximum curvature at the top

2 = Maximum curvature at the bottom

Adjusting the Armrests

You can fold back the armrests and adjust the height individually.

To adjust the armrests for height, separate the round cap (Figure 10) from the cover, loosen the hexagon nut (13 mm) behind it, adjust the armrests to the desired position, and tighten the nut. Replace the cap onto the nut.

Do not install the armrest in the lowest position, as the seat belt roller might not function properly.

Changing the Armrest Angle

You can adjust the angle of the armrests for your comfort.

To adjust the angle of the armrests, turn the adjustment knob (Figure 10).

Turning the knob to the outside (+) raises the front part of the armrest; turning the knob to the inside (-) lowers it.

Changing the Backrest Position

You can adjust the back of the seat to provide a more comfortable ride. Position the back of the seat where it is most comfortable.

Pull up the locking lever to release the backrest catch (Figure 10). When releasing the backrest catch, do not apply load to the backrest by pressing against it.

By exerting pressure on or off the front or rear of the seat, you can move the seat to the desired position. Release the locking lever to lock the backrest.

Note: The backrest should not be able to move into another position after you have locked it.

Raising and Lowering the Seat

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

1. Move the seat latch, located on the left side of the seat, rearward to unlatch the seat and pull forward on the top of the seat (Figure 11).

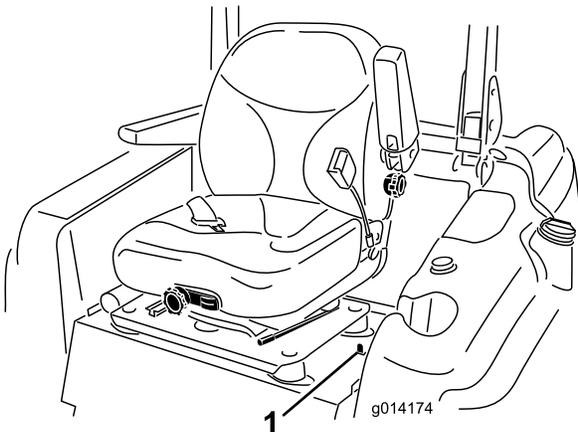


Figure 11

1. Seat latch

2. To lower the seat, pull up the seat-latch-release bar and lower the seat into the locked position.

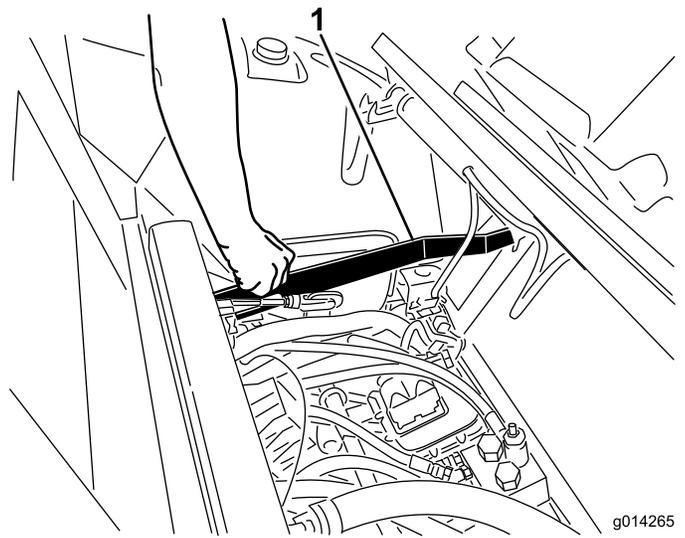


Figure 12

1. Seat-latch-release bar

During Operation

During Operation Safety

General Safety

- The owner/user can prevent and is responsible for accidents that may cause injuries to himself/herself and others and for damage to property.
- Wear appropriate clothing, including eye protection; slip-resistant, substantial footwear; and hearing protection. Wearing safety shoes and long pants is advisable and required by some local ordinances and insurance regulations. Tie back long hair, secure loose clothing, and do not wear jewelry.
- Ensure that all drives are in the NEUTRAL position, the parking brake is engaged, and you are in the operating position before you start the engine.
- Keep all body parts, including hands and feet, away from all moving parts.
- Do not operate the machine while ill, tired, or under the influence of alcohol or drugs.
- Keep the direction of the mower discharge away from people and pets.
- Do not mow in reverse unless it is absolutely necessary. If you must mow in reverse, look behind and down for small children before and while moving the machine in reverse. Stay alert and stop the machine if a child enters the area.
- Use extreme care when approaching blind corners, shrubs, trees, or other objects that may block your view.
- Do not mow near drop-offs, ditches, or embankments. The machine could suddenly roll over if a wheel goes over the edge or if the edge caves in.
- Never carry passengers on the machine.

- Operate the machine only in good visibility and appropriate weather conditions. Do not operate the machine when there is the risk of lightning.
- Do not mow on wet grass. Reduced traction could cause the machine to slide.
- Never raise the mower deck with the blades running.
- Stop the machine and inspect the blades after striking an object or if there is an abnormal vibration in the machine. Make all necessary repairs before resuming operation.
- Stop the blades whenever you are not mowing, especially while crossing loose terrain such as gravel.
- Slow down and use caution when making turns and crossing roads and sidewalks with the machine. Always yield the right-of-way.
- Turn on the flashing warning lights on the machine whenever you travel on a public road, except where such use is prohibited by law.
- Disengage the drive to the attachment and shut off the engine before adding fuel and adjusting the height of cut.
- Reduce the throttle setting before stopping the engine and, if the engine has a fuel-shutoff valve, shut off the fuel when you have finished operating the machine.
- Never run an engine in an area where exhaust gases are enclosed.
- Never leave a running engine unattended.
- Before leaving the operating position, do the following:
 - Stop the machine on level ground.
 - Disengage the power take-off and lower the attachments.
 - Set the parking brake.
 - Shut off the engine and remove the key.
 - Wait for all moving parts to stop.
- Do not change the governor settings on or overspeed the engine. Operating the engine at excessive speed may increase the potential for personal injury.
- Do not use the machine as a towing vehicle.
- Use accessories and attachments approved by The Toro® Company only.

Rollover Protection System (ROPS) Safety

- **Do not** remove the ROPS from the machine.
- Ensure that the seat belt is attached and that you can release it quickly in the event of an emergency.
- Always wear your seat belt when the ROPS is up.
- Check carefully for overhead clearances, such as branches, doorways, and electrical wires, before driving the machine under them. Do not contact them.
- Keep the ROPS in safe operating condition by thoroughly inspecting it periodically for damage and keeping all the mounting fasteners tight.

- Replace a damaged ROPS. Do not repair or revise it.
- Any alterations to a ROPS must be approved by The Toro® Company.

Slope Safety

- Slow down the machine and use extra care on hillsides. Travel in the recommended direction on hillsides. Turf conditions can affect the stability of the machine.
- Avoid starting, stopping, or turning the machine on a slope. If the tires lose traction, disengage the blade(s) and proceed slowly straight down the slope.
- Do not turn the machine sharply. Use care when reversing the machine.
- When operating the machine on a slope, always keep all cutting units lowered.
- Avoid turning the machine on slopes. If you must turn, turn slowly and gradually downhill, if possible.
- Use extra care while operating the machine with attachments; they can affect the stability of the machine.

Think Safety First

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

⚠ CAUTION

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

Wear hearing protection when operating this machine.

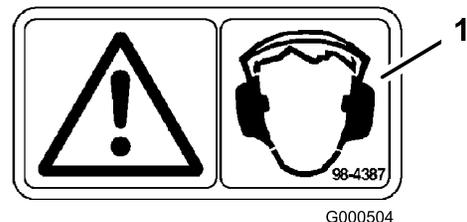


Figure 13

1. Warning— wear eye protection.
2. Warning— wear hearing protection

Using the Rollover-Protection System (ROPS)

- Keep the roll bar in the raised and locked position and use the seat belt when operating the machine.
- Ensure that you can release the seat belt quickly in an emergency situation.
- Check the area that you will mow and never fold the ROPS in areas where there are slopes, drop-offs, or water.

⚠ 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 plate is secured with the seat latch.

⚠ WARNING

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

- Lower the roll bar only when 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.

1. To lower the roll bar, remove the hairpin cotters, push the roll bar forward against the springs, and remove the 2 pins (Figure 14).

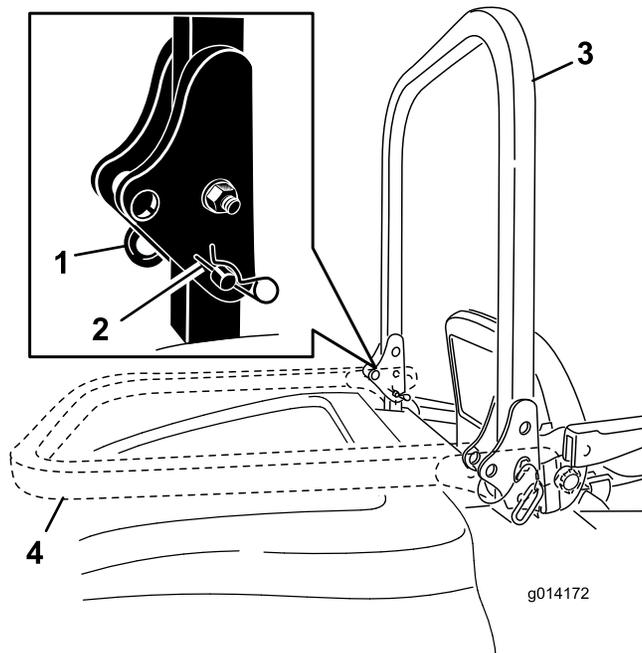


Figure 14

- | | |
|-------------------|--------------------------------|
| 1. Pin | 3. Roll bar (raised position) |
| 2. Hairpin cotter | 4. Roll bar (lowered position) |

2. Lower the roll bar to the down position (Figure 14).
3. Install the 2 pins and secure them with the hairpin cotters (Figure 14).

Important: Ensure that the seat is secured with the seat latch.

4. To raise the roll bar, remove the hairpin cotter pins and remove the 2 pins (Figure 14).
5. Raise the roll bar to the upright position and install the 2 pins and secure them with the hairpin cotters (Figure 14).

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.

Starting and Shutting off the Engine

Starting the Engine

1. Raise the roll bar up and lock it into place, sit on the seat, and fasten the seat belt.
2. Ensure that the traction pedal is in the NEUTRAL position.
3. Set the parking brake.
4. Move the power-takeoff (PTO) switch to the OFF position (Figure 15).

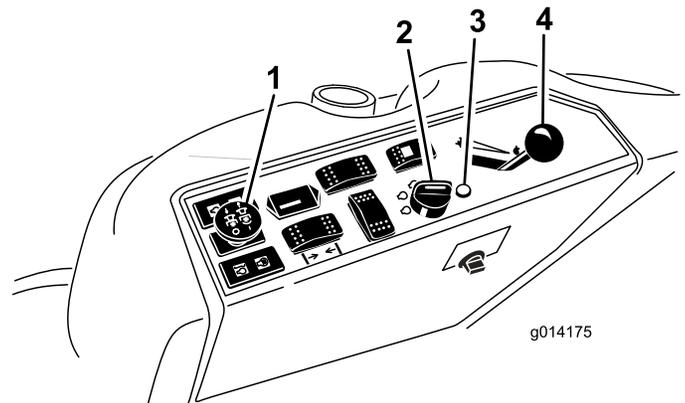


Figure 15

- | | |
|-------------------------------|--------------------|
| 1. Power-takeoff switch (PTO) | 3. Glow-plug light |
| 2. Ignition switch | 4. Throttle lever |

5. Move the throttle lever midway between the FAST and SLOW positions (Figure 15).
6. Turn the ignition key clockwise to the RUN position (Figure 16).

The glow-plug-indicator light should turn on for 6 seconds.

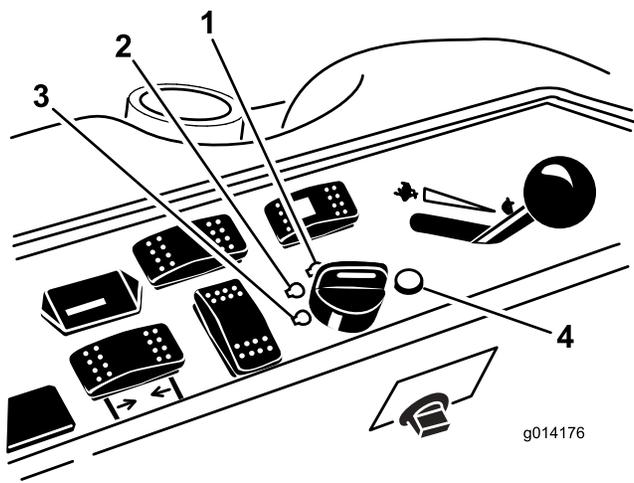


Figure 16

- | | |
|------------------|------------------------------|
| 1. Start | 3. Off |
| 2. Run/glow plug | 4. Glow-plug-indicator light |

- After the glow-plug-indicator light turns off, turn the key to the START position. When the engine starts, release the key.

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

Note: You may need to repeat this procedure when starting the engine for the first time after adding fuel to an empty fuel system.

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

Important: When you start the engine for the first time, change the engine oil, or overhaul the engine, transmission, or wheel motor, operate the machine with the throttle lever in the SLOW position in both the forward and reverse directions for 1 to 2 minutes. Also, operate the lift lever and PTO lever to ensure that all parts are operating properly. Then shut off the engine and check the fluid levels, check for oil leaks, loose parts, and any other problems.

Shutting off the Engine

- Disengage the PTO, ensure that the traction pedal is in the NEUTRAL position, set the parking brake, and move the throttle lever to the SLOW position.
- Let the engine idle for 60 seconds.
- Turn the ignition key to the OFF position (Figure 16). Wait for all moving parts to stop before leaving the operating position.
- Remove the key before transporting or storing the machine.

Important: Make sure to remove the key, as the fuel pump or accessories may run and cause the battery to lose charge.

Driving the Machine

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

Stopping the Machine

To stop the machine, release the traction pedal to the NEUTRAL position.

Set the parking brake whenever you leave the machine. Remove the key from the ignition switch.

The Safety-Interlock System

⚠ CAUTION

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

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

Understanding the Safety Interlock System

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

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

The safety-interlock system is also designed to shut off the engine when you move the traction pedal from the NEUTRAL position with the parking brake engaged. If you rise from the seat when the PTO is engaged there is a 1-second delay and then the engine shuts off.

Testing the Safety-Interlock System

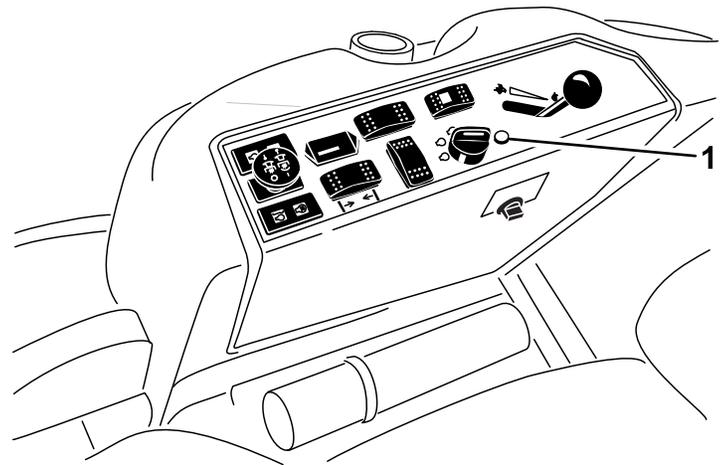
Service Interval: Before each use or daily

If the safety system does not operate as described below, have an Authorized Service Dealer repair the system immediately.

1. Sit on the seat, engage the parking brake, and move the PTO to the ON position. Try starting the engine: The engine should not start.
2. Sit on the seat, engage the parking brake, move the PTO to the OFF position, and engage the traction pedal. Try starting the engine: The engine should not start.
3. Sit on the seat, engage the parking brake, move the PTO switch to the OFF position, and allow the traction pedal to return to the NEUTRAL position. Start the engine. While the engine is running, release the parking brake, engage the PTO and rise slightly from the seat: The engine should stop within 2 seconds.
4. With an empty seat, engage the parking brake, move the PTO switch to the OFF position and move the traction pedal to the NEUTRAL position. Start the engine. While the engine is running, engage the traction pedal; the engine should stop within 2 seconds.
5. With an empty seat, disengage the parking brake, move the PTO switch to the OFF position, and allow the traction pedal to return to the NEUTRAL position. Try starting the engine: The engine should not start.

Understanding the Diagnostic Light

The machine comes with a diagnostic light that indicates if the electronic controller senses an electronic malfunction. The diagnostic light is located on the control panel (Figure 17). When the electronic controller is functioning correctly and the key switch is moved to the ON position, the controller diagnostic light will turn on for 3 seconds and turn off to indicate that the light is working properly. If the engine shuts off, the light will turn on steady until you change the key position. The light blinks if the controller detects a malfunction in the electrical system. The light stops blinking and automatically resets when you turn the key switch to the OFF position when the fault has been resolved.



g014333

Figure 17

1. Diagnostic light

When the controller diagnostic light blinks, 1 of the following problems has been detected by the controller:

- An output has been shorted.
- An output has an open circuit.

Use the diagnostic display to determine which output is malfunctioning; refer to [Checking the Interlock Switches](#) (page 21).

If the diagnostic light does not come on when the key switch is in the ON position, this indicates that the electronic controller is not operating. Possible causes are as follows:

- The light is burned out.
- The fuses are blown.
- The electronic controller is not functioning correctly.

Check the electrical connections, input fuses, and diagnostic light bulb to determine the malfunction. Ensure that the loop-back connector is secured to the wire-harness connector.

Diagnostic Ace Display

The machine comes with an electronic controller which controls most of the machine functions. The controller determines what function is required for various input switches (e.g., seat switch and key switch) and turns on the outputs to actuate solenoids or relays for the requested machine function.

For the electronic controller to control the machine as desired, each of the input switches, output solenoids, and relays must be connected and functioning properly.

Use the Diagnostic ACE display tool and overlay to help verify and correct electrical functions of the machine. Contact your Toro Distributor for assistance.

Checking the Interlock Switches

The interlock switches prevent the engine from cranking or starting unless the traction pedal is in the NEUTRAL position and the PTO is disengaged. The engine should stop when you press the traction pedal when you are not sitting on the seat or if the parking brake is engaged.

⚠ 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.

Verifying the Interlock Switch Function

1. Park the machine on a level surface, lower the attachment, shut off the engine, and engage the parking brake.
2. Raise the seat.
3. Locate the wire harness and connectors near the controller (Figure 18).

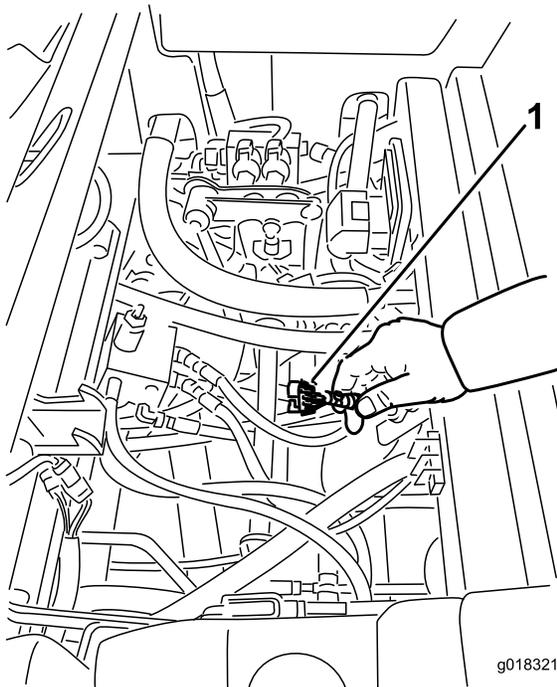
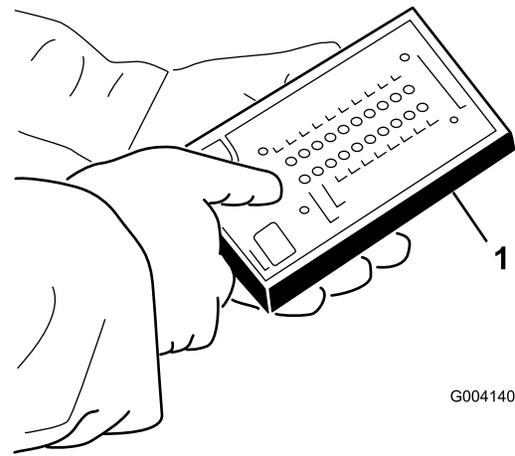


Figure 18

1. Wire harness and connectors

4. Connect the Diagnostic ACE display tool connector to the diagnostic connector (Figure 19).

Note: Ensure that the correct overlay decal is positioned on the Diagnostic ACE display.



G004140

Figure 19

1. Diagnostic ACE

5. Turn the key switch to the ON position, but do not start the engine.

Note: The red text on the overlay decal refers to input switches and the green text refers to outputs.

6. The “inputs displayed” LED, on the lower right column of the Diagnostic ACE, should be illuminated. If the “outputs displayed” LED is illuminated, press the toggle button on the Diagnostic ACE to change it to “inputs displayed.”

The Diagnostic ACE will illuminate the LED associated with each of the inputs when you close that input switch.

7. Individually change each of the switches from open to closed (i.e., sit on seat, engage the traction pedal, etc.), and note that the appropriate LED on Diagnostic ACE blinks on and off when you close the corresponding switch. Repeat this for all switches that you can change manually.
8. If a switch is closed and the appropriate LED does not turn on, check all wiring and connections to the switch and/or check the switch with an ohm meter. Replace all switches and repair wiring that are not functioning.

Note: The Diagnostic ACE also has the ability to detect which output solenoids or relays are turned on. This is a quick way to determine the source of the malfunction.

Verifying the Output Function

1. Park the machine on a level surface, lower the attachment, shut off the engine, and engage the parking brake.
2. Raise the seat.
3. Locate wire harness and connectors near the controller.
4. Carefully unplug the loopback connector from the harness connector.

5. Connect the Diagnostic ACE connector to the appropriate harness connector. If the machine comes with a front attachment, it will have 2 controllers.

Note: Ensure that the correct overlay decal is positioned on the Diagnostic ACE.

6. Turn the key switch to the ON position, but do not start the engine.

Note: The red text on the overlay decal refers to input switches and the green text refers to outputs.

7. The “inputs displayed” LED, on the lower right column of the Diagnostic ACE, should be illuminated. If the “outputs displayed” LED is illuminated, press the toggle button on the Diagnostic ACE to change it to “inputs displayed.”

Note: You may need to toggle between “inputs displayed” and “outputs displayed” several times to do the following step. To toggle back and forth, press the toggle button once. Do this as often as necessary; do not hold the button.

8. Sit on the seat and attempt to operate the desired function of the machine. The appropriate output LEDs should illuminate to indicate that the ECM is turning on that function.

Note: If the correct output LEDs do not illuminate, verify that the required input switches are in the necessary positions to allow that function to occur. Verify the correct switch function.

If the output LEDs are on as specified but the machine does not function properly, this indicates a non-electrical problem; repair as needed.

Note: If each output switch is in the correct position and functioning correctly but the output LEDs are not correctly illuminated, this indicates an ECM problem. If this occurs, contact your Toro Distributor for assistance.

Important: Do not leave the Diagnostic ACE display connected to the machine. It is not designed to withstand the environment of the everyday use of the machine. After using the Diagnostic ACE, disconnect it from the machine and connect the loop-back connector to the wire-harness connector. The machine cannot operate without the loopback connector installed on the wire harness. Store the Diagnostic ACE in dry, secure location in the shop, not on the machine.

Operating the Mower

Raising and Lowering the Mower

The deck-lift switch raises and lowers the mower deck (Figure 20). The engine must be running for you to use this switch.

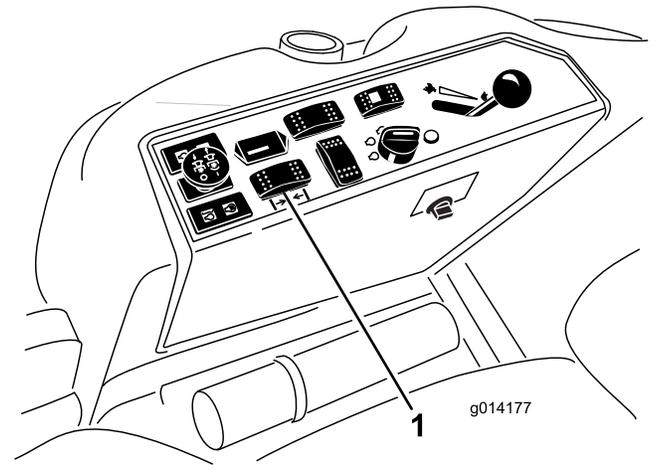


Figure 20

1. Deck-lift switch

- To lower the mower deck, push the switch forward.
- To raise the mower deck, push the switch rearward.

Important: Do not continue to hold the switch back after the mower has fully raised. Doing so will damage the hydraulic system.

Engaging the Power Takeoff (PTO)

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

1. If the engine is cold, allow the engine to warm up 5 to 10 minutes before engaging the PTO.
2. While seated in the seat, ensure that the traction pedal is in the NEUTRAL position and that the engine is at full throttle.
3. Pull up the PTO switch to engage it (Figure 21).

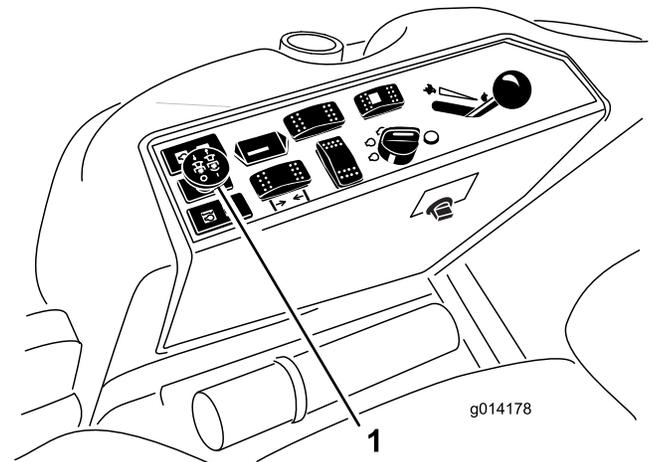


Figure 21

1. PTO switch

Disengaging the PTO

To disengage, push the PTO switch to the OFF position.

Operating Tips

Fast Throttle Setting/Ground Speed

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

Mowing Direction

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

Cutting Speed

To improve cut quality, use a slower ground speed.

Avoid Cutting Too Low

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

Select the Proper Height-of-Cut Setting to Suit Conditions

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

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

Long Grass

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

Keep the Mower Clean

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

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

Blade Maintenance

Maintain a sharp blade throughout the cutting season, because a sharp blade cuts cleanly without tearing or shredding the grass blades. Tearing and shredding turns grass brown at the edges, which slows growth and increases the chance of disease. Check the blades daily for sharpness and for any wear or damage. Sharpen the blades as necessary. If a blade is damaged or worn, replace it immediately with a genuine Toro replacement blade. Refer to [Blade Maintenance \(page 23\)](#).

After Operation

After Operation Safety

General Safety

- Clean grass and debris from the cutting units, drives, mufflers, and engine to help prevent fires. Clean up oil or fuel spills.
- Shut off the fuel while storing or transporting the machine.
- Disengage the drive to the attachment whenever you are transporting or not using the machine.
- Allow the engine to cool before storing the machine in any enclosure.
- Never store the machine or fuel container where there is an open flame, spark, or pilot light, such as on a water heater or on other appliances.

Towing Safety

- Tow only with a machine that has a hitch designed for towing. Do not attach towed equipment except at the hitch point.
- Follow the manufacturer's recommendation for weight limits for towed equipment and towing on slopes. On slopes, the weight of the towed equipment may cause loss of traction and loss of control.
- Never allow children or others in or on towed equipment.
- Travel slowly and allow extra distance to stop when towing.

Pushing the Machine by Hand

If the machine stalls or runs out of fuel, you may need to push it. You must first open both of the hydraulic bypass valves.

Important: Always push the machine by hand and never a long distance. Never tow the machine, because damage to the hydraulic system may occur.

Pushing the Machine

1. Disengage the power takeoff (PTO), turn the ignition key to off, and apply the parking brake.

2. Remove the key from the ignition switch. **You must open both bypass valves.**
3. Lift the seat.
4. Rotate each by-pass valve counterclockwise 1 turn (Figure 22).

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

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

5. Disengage the parking brake before pushing the machine.

Changing to Machine Operation

1. Rotate each bypass valve clockwise 1 turn and hand tighten them (Figure 22).

Note: Do not over tighten the by-pass valves.

2. Torque the valves approximately 8 N·m (71 in-lb) as shown in Figure 22.

Note: The machine does not drive unless the bypass valves are turned in.

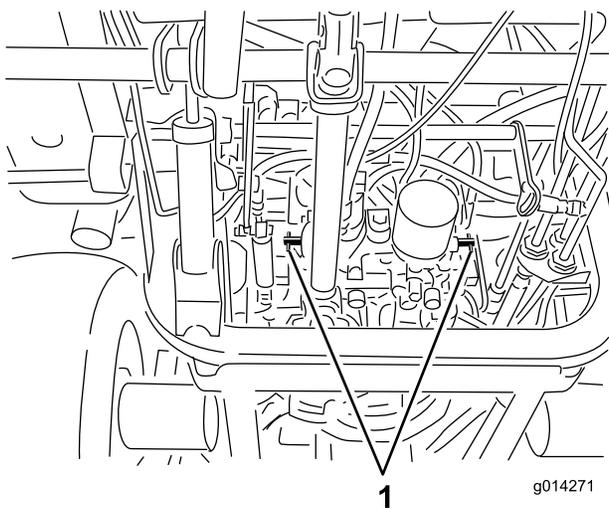


Figure 22

1. Bypass valves
-

Hauling the Machine

- Use care when loading or unloading the machine into a trailer or a truck.
- Use full-width ramps for loading the machine into a trailer or a truck.
- Tie the machine down securely using straps, chains, cable, or ropes. Both front and rear straps should be directed down and outward from the machine.

Maintenance

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

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first 10 hours	<ul style="list-style-type: none"> • Check the tension on the alternator belt. • Torque the wheel-lug nuts.
After the first 50 hours	<ul style="list-style-type: none"> • Change the engine oil and filter.
After the first 200 hours	<ul style="list-style-type: none"> • Change the hydraulic fluid and filter.
Before each use or daily	<ul style="list-style-type: none"> • Test the safety-interlock system. • Check the engine-oil level. • Check the engine-coolant level. • Check the hydraulic fluid level.
Every 50 hours	<ul style="list-style-type: none"> • Grease the bearing and bushing grease fittings. Grease the bearing and bushing grease fittings more frequently in extremely dusty and dirty conditions. • Check the battery cable connections. • Check the tire pressure.
Every 100 hours	<ul style="list-style-type: none"> • Check the tension on the alternator belt.
Every 150 hours	<ul style="list-style-type: none"> • Change the engine oil and filter.
Every 200 hours	<ul style="list-style-type: none"> • Torque the wheel-lug nuts.
Every 400 hours	<ul style="list-style-type: none"> • Service the air cleaner. (Service the air cleaner earlier if the air-cleaner indicator shows red. Service it more frequently in extremely dirty or dusty conditions.) • Replace the fuel filter canister. • Check the fuel lines and connections.
Every 800 hours	<ul style="list-style-type: none"> • Change the hydraulic fluid and filter. • Inspect the engine-valve clearance. Refer to your engine operator's manual.
Every 2 years	<ul style="list-style-type: none"> • Drain and clean the fuel tank.

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

Daily Maintenance Checklist

Duplicate this page for routine use.

Maintenance Check Item	For the week of						
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Check the Safety-Interlock Operation							
Check the Parking-Brake Operation							
Check the Fuel Level							
Check the Hydraulic-Fluid Level							
Check the Engine-Oil Level							
Check the Cooling-System-Fluid Level							
Check the Drain Water/Fuel Separator							
Check the Air-Filter-Restriction Indicator ³							
Check the Radiator and Screen for Debris							
Check for Unusual Engine Noises ¹							
Check for Unusual Operating Noises							
Check the Hydraulic Hoses for Damage							
Check for Fluid Leaks							
Check the Tire Pressure							
Check the Instrument Operation							
Lubricate All Grease Fittings ²							
Touch up Damaged Paint							
1. Check the glow plug and injector nozzles if the engine starts hard or runs rough or if there is excess smoke 2. Immediately after every washing, regardless of the interval listed 3. If the indicator shows red							

Notation for Areas of Concern

Inspection performed by:		
Item	Date	Information

⚠ CAUTION

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

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

GROUNDMASTER 360

CHECK/SERVICE (daily)

1. OIL LEVEL, ENGINE
2. OIL LEVEL, HYDRAULIC TANK
3. COOLANT LEVEL, RADIATOR
4. FUEL /WATER SEPARATOR
5. PRECLEANER - AIR CLEANER
6. RADIATOR SCREEN
7. BRAKE FUNCTION
8. TIRE PRESSURE
9. BATTERY
10. BELTS - DECK, FAN, ALTERNATOR
11. GEARBOX

GREASING - SEE OPERATOR'S MANUAL

QUICK REFERENCE AID

FLUID SPECIFICATIONS/CHANGE INTERVALS

SEE OPERATOR'S MANUAL FOR INITIAL CHANGES.	FLUID TYPE	CAPACITY	CHANGE INTERVAL*		FILTER PART NO.
			FLUID	FILTER	
A. ENGINE OIL	4 CYL - 1.5L	5.5 QTS. (5.2 LITERS) 3.9 QTS. (3.7 LITERS)	150 HRS.	150 HRS.	108-3841
	3 CYL - 1.1L				
B. HYDRAULIC CIRCUIT OIL	MOBIL 424	4.5 GALS. (17 LITERS)	800 HRS.	800 HRS.	108-5194
C. AIR CLEANER				SEE INDICATOR	108-3810
D. WATER SEPARATOR				400 HRS.	110-9049
E. FUEL TANK	NO. 2-Diesel	13.5 GALS. (51.1 LITERS)	Drain and flush, 2 yrs.		
F. COOLANT	50/50 Ethylene glycol/water	8 QTS. (7.5 LITERS)	Drain and flush, 2 yrs.		
G. GEARBOX	SAE EP90W	12 oz. (355 ml)	400 HRS.		

*SEE OPERATOR'S MANUAL FOR INITIAL CHANGES / WINTER USE.

Figure 23
Service Interval Chart

Premaintenance Procedures

Pre-Maintenance Safety

- Keep all parts of the machine in good working condition and all hardware tightened, especially blade-attachment hardware. Replace all worn or damaged decals.
- Never allow untrained personnel to service the machine.
- Before adjusting, cleaning, or repairing the machine, do the following:
 1. Move the machine to level ground.
 2. Disengage the drives.
 3. Lower the cutting units.
 4. Move the traction pedal to the NEUTRAL position.
 5. Engage the parking brake.
 6. Move the throttle switch to the LOW-IDLE position.
 7. Shut off the engine and remove the key.
 8. Wait for all moving parts to stop.
- Whenever you park or store the machine, or leave it unattended, lower the cutting units unless you use a positive mechanical lock.
- If possible, do not perform maintenance on the machine while the engine is running. If you must run the engine to perform maintenance on the machine, keep your hands, feet, other body parts, and clothing away from all moving parts, the mower-discharge area, and the underside of the mowers.
- Do not touch parts of the machine or an attachment that may be hot from operation. Allow the parts to cool before attempting to maintain, adjust, or service them.
- Use jack stands to support the machine and/or its components when required.
- Carefully release pressure from components with stored energy.
- If your machine requires major repairs or if you desire assistance, contact an Authorized Toro Distributor.
- 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.

Preparing the Machine for Maintenance

1. Ensure that the PTO is disengaged.
2. Park the machine on a level surface.

3. Set the parking brake.
4. Shut off the engine and wait for all moving parts to stop.
5. Turn the ignition key to the STOP position and remove it.
6. Allow machine components to cool before performing maintenance.

Using the Hood-Prop Rod

1. Release the hood latches.
2. Lift up the hood until you can position the prop rod behind the frame tube (Figure 24).
3. Lower the hood until the rod is in front of and resting against the frame tube.
4. To lower the hood, raise the hood until you can raise the prop rod above the frame tube, then lower the hood.
5. Secure the hood latches.

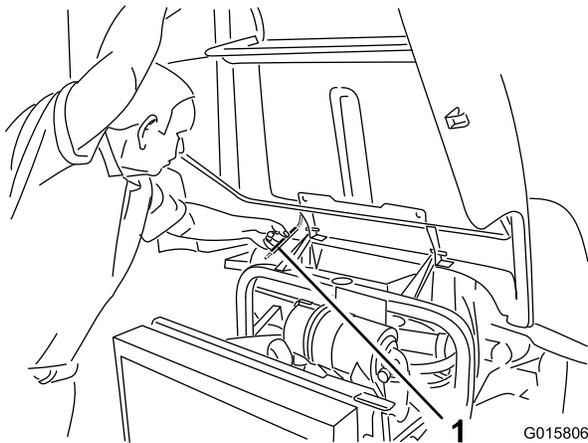


Figure 24

1. Prop rod

Lubrication

Greasing the Bearings and Bushings

Service Interval: Every 50 hours Grease the bearing and bushing grease fittings more frequently in extremely dusty and dirty conditions.

The machine has grease fittings that you must lubricate regularly with No. 2 lithium grease. Lubricate the grease fittings immediately after every washing, regardless of interval specified.

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

Note: To access the grease fittings for the rear-steering linkage, remove the storage compartment.

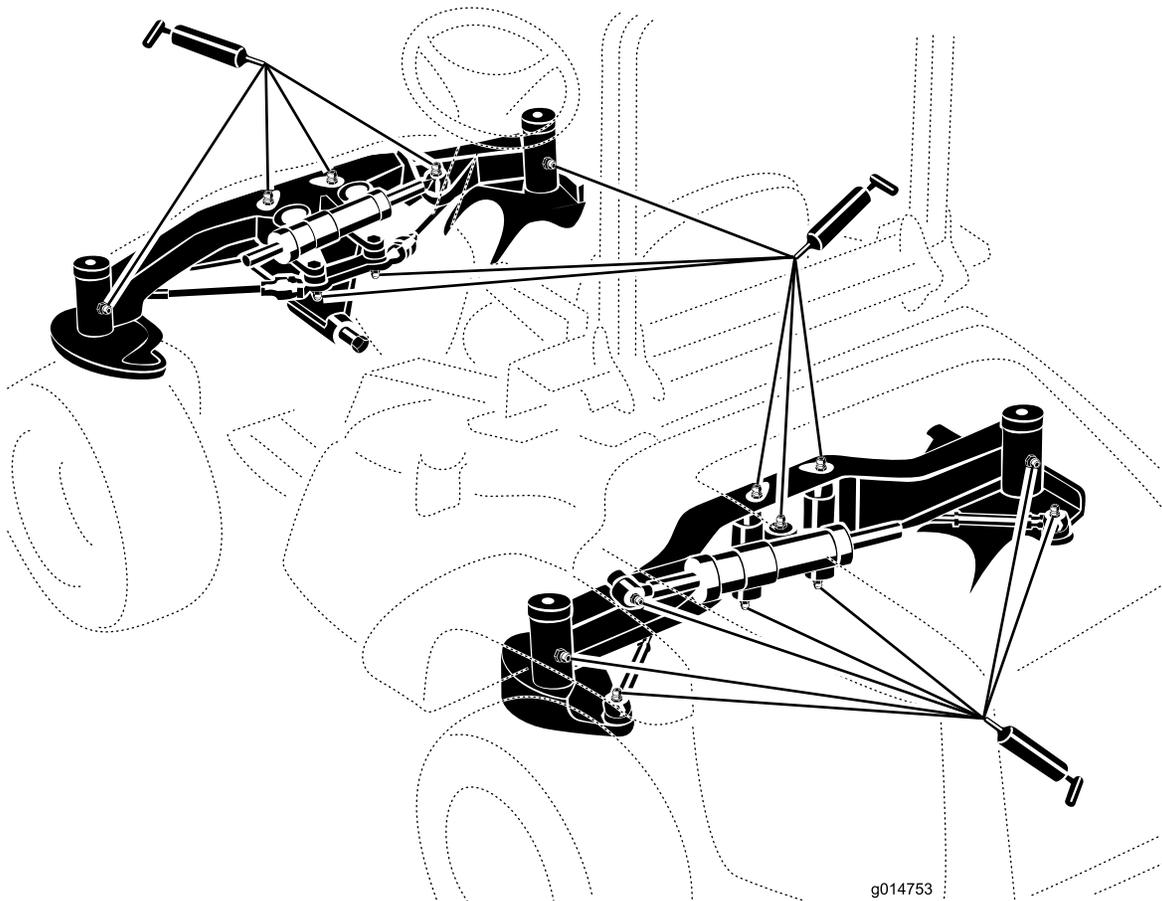


Figure 25

Note: The bearing life can be negatively affected by improper washing procedures. Do not wash the machine when it is still hot and avoid directing high-pressure or high volume spray at the bearings or seals.

Engine Maintenance

Engine Safety

Shut off the engine before checking the oil or adding oil to the crankcase.

Servicing the Air Cleaner

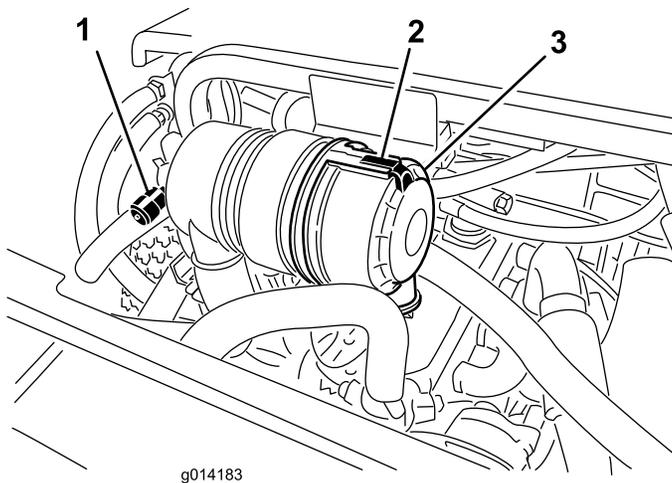
Service Interval: Every 400 hours

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

Service the air-cleaner filter only when the service indicator (Figure 26) requires it. Changing the air filter before it is necessary only increases the chance of dirt entering the engine when you remove the filter.

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

1. Release the latch securing the air-cleaner cover to the air-cleaner body (Figure 26).



g014183
Figure 26

1. Air-cleaner-service indicator
2. Air-cleaner cover
3. Air-cleaner-cover latch

2. Remove the cover from the air-cleaner body. Before removing the filter, use clear and dry low-pressure air (276 kPa or 40 psi) to help remove large accumulations of debris packed between outside of the filter and the canister. **Avoid using high-pressure air, which could force dirt through the filter into the intake tract.**

Note: This cleaning process prevents debris from migrating into the intake when you remove the filter.

3. Remove and replace the filter.

Important: Do not clean the used element to prevent damaging the filter media. Inspect the

new filter for shipping damage, checking the sealing end of the filter and the body. **Do not use a damaged element.** Insert the new filter by applying pressure to the outer rim of the element to seat it in the canister. **Do not apply pressure to the flexible center of the filter.**

4. Clean the dirt-ejection port located in the removable cover.
5. Remove the rubber outlet valve from the cover, clean the cavity and replace the outlet valve.
6. Install the cover orienting the rubber outlet valve in a downward position—approximately between the 5 o'clock to 7 o'clock positions when viewed from the end.
7. Secure the latch.

Checking the Engine-Oil Level

Service Interval: Before each use or daily

The engine is shipped with oil in the crankcase; however, check the oil level before and after you start the engine for the first time.

The crankcase capacity is approximately 5.2 L (5.5 US qt) with the filter.

Use high-quality engine oil that meets the following specifications:

- API Classification Level Required: CH-4, CI-4 or higher
- 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 distributor in either 15W-40 or 10W-30 viscosity.

1. Perform the pre-maintenance procedure; refer to [Preparing the Machine for Maintenance \(page 27\)](#).
2. Open the hood.
3. Remove the dipstick, wipe it clean, and install it (Figure 27).

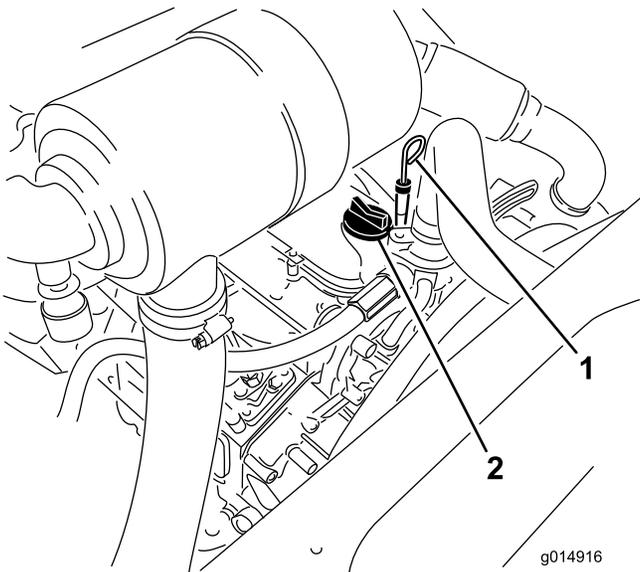


Figure 27

1. Dipstick
2. Oil-fill cap

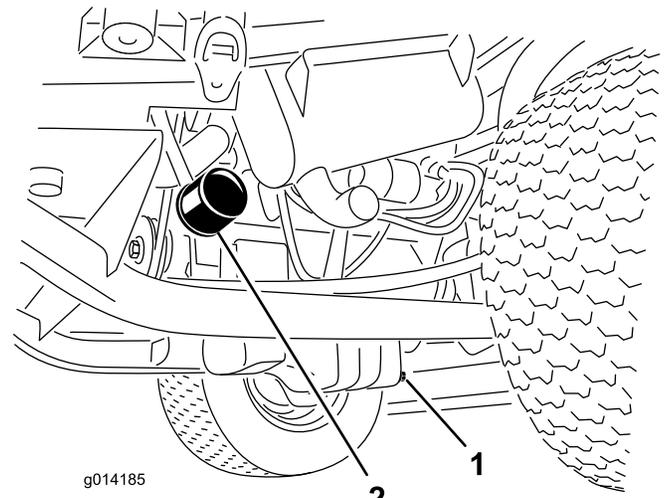


Figure 28

1. Oil-drain plug
2. Oil filter

4. Remove dipstick and check the oil level on dipstick. The oil level should be up to the FULL mark.
5. If the oil level is below the FULL mark, remove the fill cap (Figure 27) and add oil until level reaches the FULL mark on dipstick. **Do not overfill.**

Important: Be sure to keep the engine oil level between the upper and lower limits on the oil gauge. Engine failure may occur as a result of over filling or under filling the engine oil and running the engine.

6. Install the oil fill cap and close the hood.

2. When the oil stops, install the drain plug.
3. Remove the oil filter (Figure 28).
4. Apply a light coat of clean oil to the new filter seal.
5. Install the replacement oil filter to the filter adapter. Turn the oil filter clockwise until the rubber gasket contacts the filter adapter, then tighten the filter an additional 1/2 turn.

Important: Do not over-tighten the filter.

6. Add oil to the crankcase; refer to [Checking the Engine-Oil Level](#) (page 30).

Changing the Engine Oil and Filter

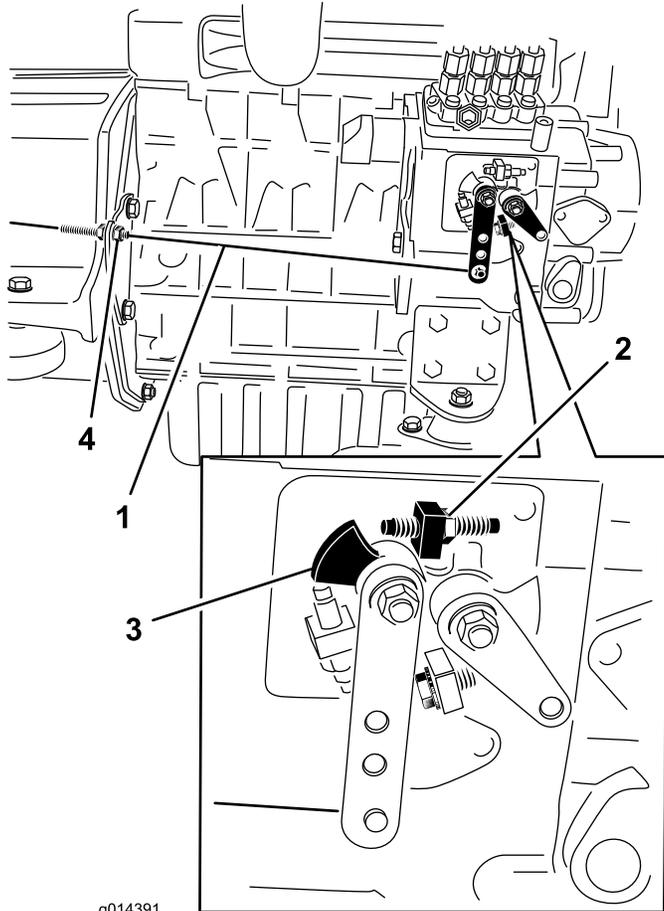
Service Interval: After the first 50 hours

Every 150 hours

1. Remove the drain plug (Figure 28) and let the oil flow into a drain pan.

Adjusting the Throttle

1. Move the throttle lever forward to the front of the control panel slot and then move it back approximately 3 mm (1/8 inch) into the FAST idle position.
2. Check the position of the speed control lever on the fuel-injection pump. The speed-control lever should contact the high-speed screw when the throttle-control lever is in the FAST (detent) position (Figure 29).



g014391

Figure 29

- | | |
|---------------------|------------------------|
| 1. Throttle cable | 3. Speed-control lever |
| 2. High-speed screw | 4. Jam nuts |

3. If necessary, adjust the position of the jam nuts on the throttle-control cable until the speed-control lever contacts the high-speed screw when the throttle-control lever is in the FAST (detent) position (Figure 29).
4. Ensure that the cable jam nuts are fully tightened after the adjustment.

Fuel System Maintenance

Note: Refer to [Filling the Fuel Tank](#) (page 13) for proper fuel recommendations.

⚠ DANGER

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

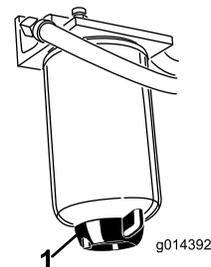
- Use a funnel and fill the fuel tank outdoors, in an open area, when the engine is off and is cold. Wipe up any fuel that spills.
- Do not fill the fuel tank completely full. Add fuel to the fuel tank until the level is to the bottom of the filler neck.
- Never smoke when handling fuel and stay away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

Servicing the Water Separator

Service Interval: Every 400 hours

Drain the water or other contaminants from the water separator (Figure 30) daily.

1. Place a clean container under the fuel filter.
2. Loosen the drain plug on the bottom of the filter canister (Figure 30).



g014392

Figure 30

1. Drain plug

3. Clean the area where the filter canister mounts.
4. Remove the filter canister and clean the mounting surface.
5. Lubricate the gasket on the filter canister with clean oil.
6. Install the filter canister by hand until the gasket contacts mounting surface, then rotate it an additional 1/2 turn.

7. Tighten the drain plug on the bottom of the filter canister.

Bleeding the Fuel System

You must bleed the fuel system before starting the engine if any of the following have occurred:

- Initial start up of a new machine
 - The engine has ceased running due to lack of fuel.
 - Maintenance has been performed upon fuel system components (i.e., filter replaced, separator serviced, etc.)
1. Perform the pre-maintenance procedure; refer to [Preparing the Machine for Maintenance \(page 27\)](#) and ensure that the fuel tank is at least half full.
 2. Open the hood and secure it with the prop rod.
 3. Open the air-bleed screw on the fuel-injection pump ([Figure 31](#)) with a 12 mm wrench.

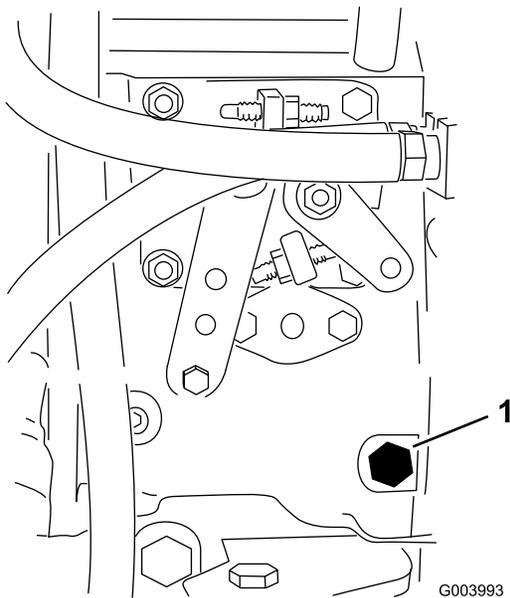


Figure 31

1. Bleed screw

4. Turn the key in the ignition switch to the ON position. The electric fuel pump will begin operation, thereby forcing air out around the air bleed screw. Leave the key in the ON position until a solid stream of fuel flows out around the screw.
5. Tighten the screw and turn the key to the OFF position.

Note: The engine should start after you perform this procedure. However, if engine does not start, air may be trapped between injection pump and the injectors; refer to [Bleeding Air from the Fuel Injectors \(page 33\)](#).

Bleeding Air from the Fuel Injectors

Note: Use this procedure only if the fuel system has been purged of air through normal priming procedures and the engine does not start; refer to [Bleeding the Fuel System \(page 33\)](#).

1. Loosen the pipe connection to the No. 1 nozzle and holder assembly ([Figure 32](#)).

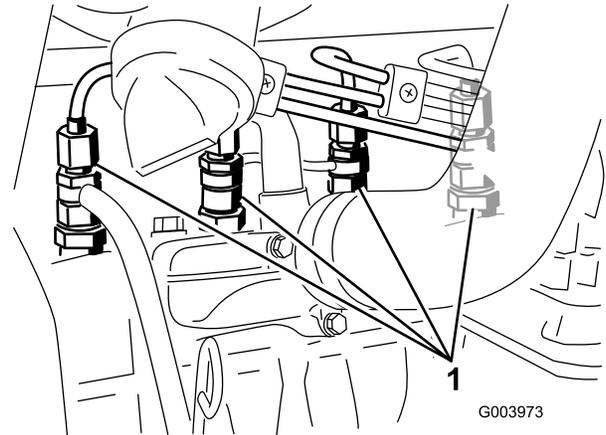


Figure 32

1. Fuel injectors

2. Turn the key in the key switch to the ON position and watch the fuel flow around the connector. When you observe a solid flow of fuel, turn the key to the OFF position.
3. Tighten the pipe connector securely.
4. Repeat steps 1 through 3 for the remaining nozzles.

Cleaning the Fuel Tank

Service Interval: Every 2 years

Drain and clean the fuel tank every 2 years. Also, remove and clean the in-line strainers after draining the tank. Use clean diesel fuel to flush out the tank.

Important: Drain and clean the tank if the fuel system becomes contaminated or if you store the machine for an extended period of time.

Checking the Fuel Lines and Connections

Service Interval: Every 400 hours

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

Electrical System Maintenance

Electrical System Safety

- Disconnect the battery before repairing the machine. Disconnect the negative terminal first and the positive last. Connect the positive terminal first and the negative last.
- Battery acid is poisonous and can cause burns. Avoid contact with your skin, eyes, and clothing. Protect your face, eyes, and clothing when working with a battery.
- Battery gases can explode. Keep cigarettes, sparks, and flames away from the battery.
- Charge the batteries 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.
- Do not use a pressure washer near any electronic components.

WARNING

CALIFORNIA Proposition 65 Warning

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

Checking the Fuses

If the machine stops or has other electrical-system issues, check the fuses. Grasp each fuse in turn and remove them 1 at a time, checking to see if any are blown. If you need to replace a fuse, always use the **same type and amperage rated fuse** as the 1 you are replacing; **otherwise, you could damage the electrical system** (refer to the decal next to the fuses for a diagram of each fuse and its amperage).

The traction-unit fuses are located under the seat ([Figure 33](#)).

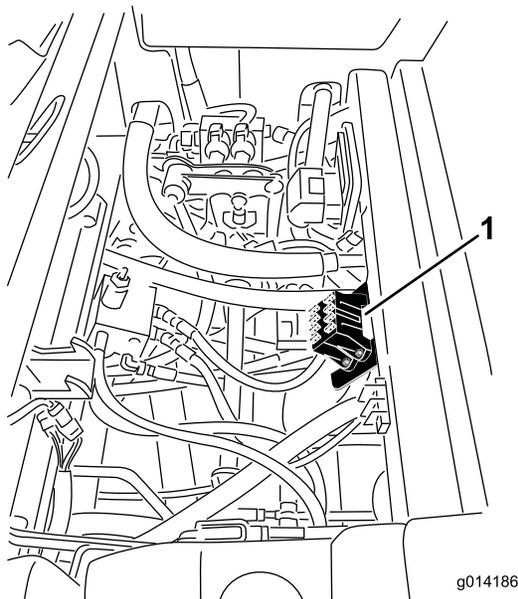


Figure 33

1. Location of the fuse block

Storing the Battery

If you store the machine for more than 30 days, remove the battery and charge it fully. Either store it on a shelf or on the machine. Leave the cables disconnected if you store it on the machine. Store the battery in a cool atmosphere to avoid quick deterioration of the charge in the battery. To prevent the battery from freezing, ensure that it is fully charged. The specific gravity of a fully charged battery is 1.265 to 1.299.

Servicing the Battery

Service Interval: Every 50 hours

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

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

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

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

⚠ WARNING

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

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

Drive System Maintenance

Checking the Tire Pressure

Service Interval: Every 50 hours

Maintain the air pressure in the front and rear tires. The correct air pressure is 172 kPa (25 psi) in the rear tires and 103 kPa (15 psi) in the front tires. If a cab is installed on the machine, the front and rear tires should be inflated to 172 kPa (25 psi). Uneven tire pressure can cause an uneven cut. Check the tires when they are cold to get the most accurate pressure reading.

Cooling System Maintenance

Cooling System Safety

⚠ CAUTION

Discharge of hot, pressurized coolant or touching a hot radiator and surrounding parts can cause severe burns.

- **Do not remove the radiator cap when the engine is hot. Always allow the engine to cool at least 15 minutes or until the radiator cap is cool enough to touch without burning your hand before removing the radiator cap.**
- **Do not touch the radiator and surrounding parts that are hot.**

⚠ DANGER

Swallowing engine coolant can cause poisoning.

- **Do not swallow engine coolant.**
- **Keep out of reach from children and pets.**

Checking the Cooling System

Service Interval: Before each use or daily

⚠ DANGER

The rotating fan and drive belt can cause personal injury.

- **Do not operate the machine without the covers in place.**
- **Keep your fingers, hands and clothing clear of rotating fan and drive belt.**
- **Shut off the engine and remove the ignition key before performing maintenance.**

The cooling system is filled with a 50/50 solution of water and permanent ethylene glycol anti freeze. Check the level of the coolant in the expansion tank at the beginning of each day before starting the engine. The capacity of the cooling system is 7.5 L (6 US qt).

1. Check the level of the coolant in the expansion tank (Figure 34). The coolant level should be between the marks on the side of the tank.
2. If coolant level is low, remove the expansion tank cap and replenish the system. **Do not overfill.**

3. Install the expansion-tank cap.

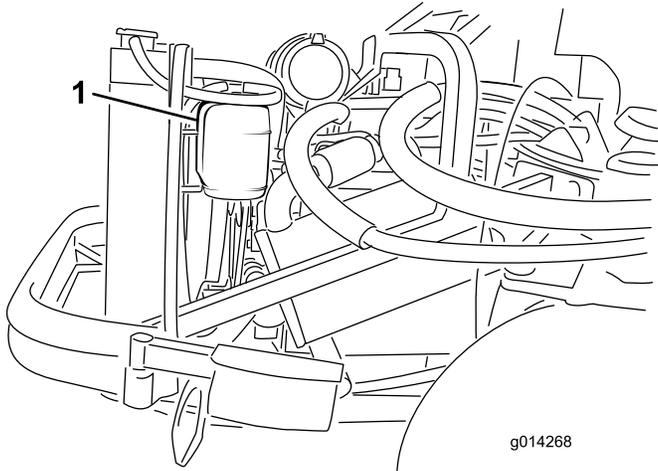


Figure 34

1. Expansion tank
-

Brake Maintenance

Adjusting the Service Brakes

Adjust the service brakes when there is more than 25 mm (1 inch) of free travel of the brake pedal, or when the brakes do not work effectively. Free travel is the distance that the brake pedal moves before you feel braking resistance.

Note: Use the wheel-motor backlash to rock the drums back and forth to ensure that the drums are free prior to and after adjustment.

1. To reduce free travel of the brake pedals, tighten the brakes by loosening the front nut on the threaded end of the brake cable (Figure 35).

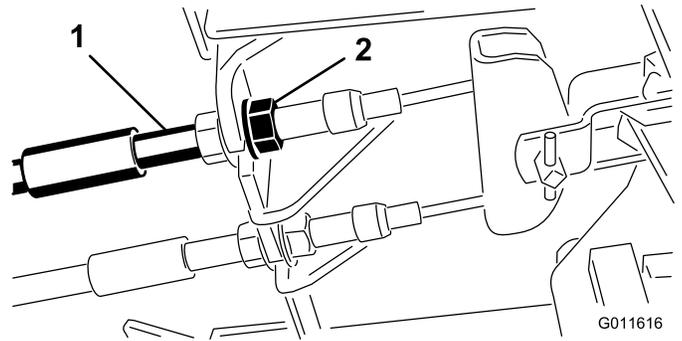


Figure 35

1. Brake cables
 2. Front nuts
-

2. Tighten the rear nut to move the cable backward until brake pedals have 1.27 to 1.9 cm (1/2 to 3/4 inch) of free travel before the wheels lock up.
3. Tighten the front nuts, ensuring that both cables actuate the brakes simultaneously.

Adjusting the Parking Brake

If the parking brake fails to engage, adjust the brake pawl.

1. Loosen the 2 screws securing the parking-brake pawl to the frame (Figure 36).

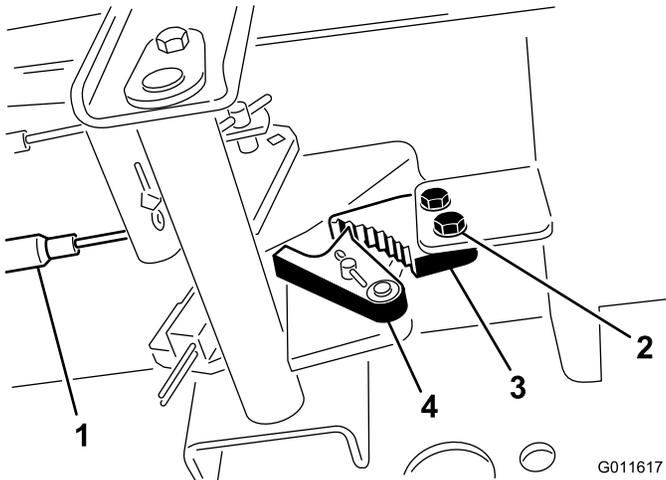


Figure 36

- | | |
|-----------------|-----------------------|
| 1. Brake cables | 3. Parking-brake pawl |
| 2. Screws (2) | 4. Brake detent |

2. Press the parking brake pedal forward until the brake detent completely engages on the brake pawl (Figure 36).
3. Tighten the 2 screws locking the adjustment.
4. Press the brake pedal to release the parking brake.
5. Check the adjustment and adjust it as required.

Belt Maintenance

Checking the Alternator Belt

Service Interval: Every 100 hours

After the first 10 hours

1. Open the hood and secure the prop rod.
2. Check the tension of the alternator belt by pressing it (Figure 37) midway between the alternator and the crankshaft pulleys with 10 kg (22 lb) of force.

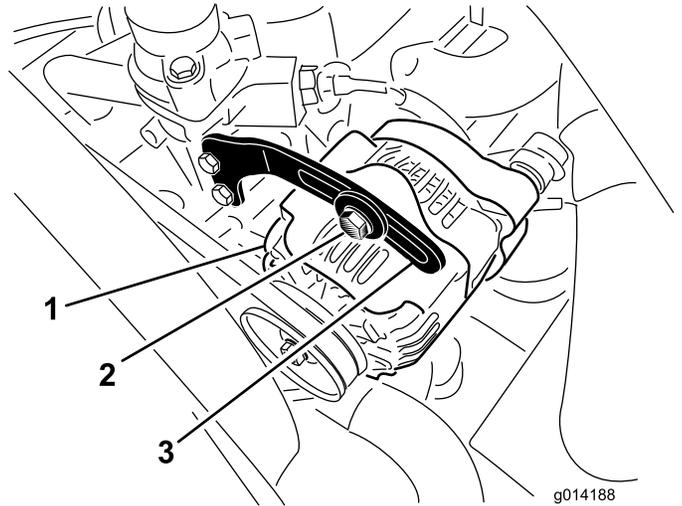


Figure 37

- | | |
|---------------|----------|
| 1. Alternator | 3. Brace |
| 2. Bolt | |

The belt should deflect 11 mm (7/16 inch). If the deflection is incorrect, proceed to step 3. If it is correct, you are finished with this procedure.

3. Loosen the bolt securing the brace to the alternator (Figure 37) and the alternator pivot bolt.
4. Insert a pry bar between the alternator and the engine and pry on the alternator.
5. When you achieve the proper tension, tighten the alternator, brace, and pivot bolts to secure the adjustment.

Controls System Maintenance

Adjusting the Traction Drive for Neutral

Note: If the machine has recently had the hydraulic fluid changed or the traction motors or hoses replaced, you must remove any air trapped in the system before performing this procedure. You can accomplish this by operating the machine in forward and reverse for a few minutes and then replenishing the fluid as required.

When you move the machine to a level surface, it must not creep when you release the traction pedal. If the machine does creep, adjust the traction drive as follows:

1. Perform the pre-maintenance procedure; refer to [Preparing the Machine for Maintenance \(page 27\)](#).
2. Jack up the rear of the machine until the rear tires are off the floor. Support the machine with jack stands to prevent it from falling accidentally.

Note: On 4-wheel-drive models, the front tires must also be off the floor and supported by jack stands.

3. Start the engine, set the throttle to the SLOW position, and observe the direction that the rear tires rotate.
 - If the left, rear tire is rotating, loosen the jam nuts on the left transmission control rod ([Figure 38](#)).

Note: The forward end of the control rod has a left-hand thread. The rear end of the rod, which is connected to the transmission, has a right-hand thread.

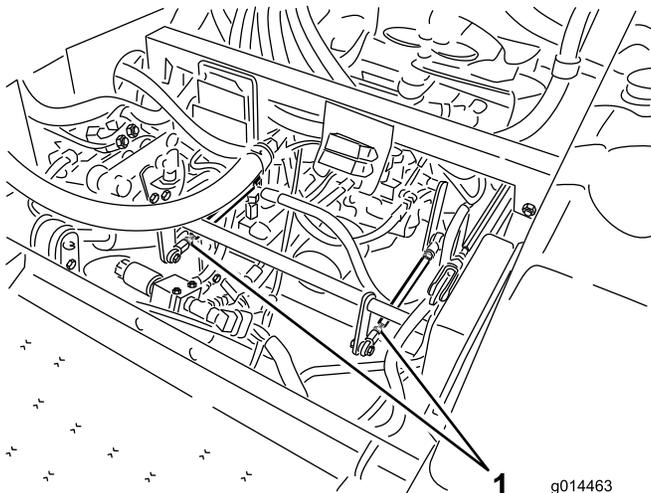


Figure 38

1. Transmission-control rods

- If the left, rear tire is rotating in reverse, lengthen the rod by slowly turning the rod counterclockwise (as viewed from the front) until the left, rear tire

stops rotating or you detect minimal rotation in reverse.

- If the left, rear tire is rotating forward, shorten the rod by slowly turning the rod clockwise (as viewed from the front) until the left, rear tire stops rotating.
4. Move the throttle to the FAST position. Ensure that the wheel remains stopped or you detect a minimal creep in reverse. Adjust the rod as required.
 5. Tighten the jam nuts.
 6. Repeat the procedure for the right, rear tire, if required, by using the right transmission control rod.
 7. Shut off the engine, remove the jack stands, and lower the machine to the floor.
 8. Test drive the machine to ensure that it does not creep.

Adjusting the Maximum Ground Speed

1. Disengage the PTO, release the traction pedal to the NEUTRAL position, and set the parking brake.
2. Move the throttle lever to the SLOW position, stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Loosen the jam nut on the stop bolt for the traction pedal ([Figure 39](#)).

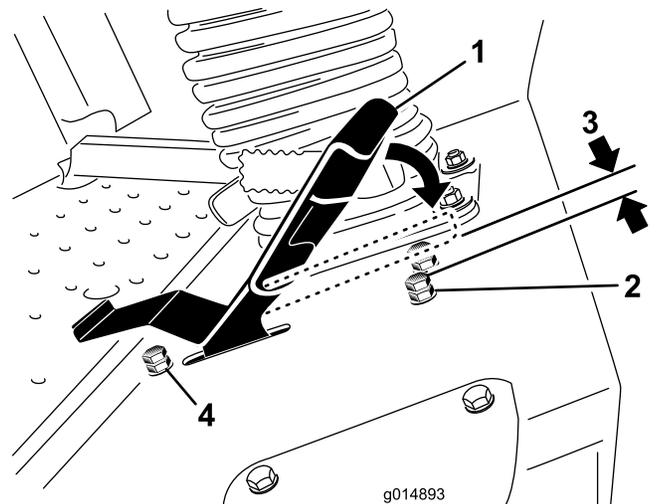


Figure 39

1. Traction pedal
2. Stop bolt with a jam nut (forward)
3. 0.060 inch (1.5 mm)
4. Stop bolt w/ jam nut (reverse)

4. Adjust the stop bolt all the way in (away from the traction pedal).
5. Using your hand, push the traction pedal all the way forward (with light pressure) until it stops and hold it there. Maintain light pressure on the pedal when pushing it to the fully forward position.

6. With the seat in the raised position, verify that you are not overloading the linkage by ensuring that the transmission does not move when you press the pedal to the stop.
7. Adjust the stop bolt out (toward the traction pedal) until there is a gap of 1.5 mm (0.060 inch) between the head of the stop bolt and the bottom of the traction pedal.
8. Tighten the jam nut to secure the stop bolt in place.

Note: You can adjust the reverse stop bolt if the maximum reverse speed is too slow. For a faster reverse speed, adjust the stop bolt inward; for a slower reverse speed, adjust the stop bolt outward.

Hydraulic System Maintenance

The reservoir is filled at the factory with approximately 17 L (18 US qt) of high-quality tractor transmission/hydraulic fluid. The recommended replacement fluid is as follows:

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

Alternate fluids: If the Toro fluid is not available, you can use Mobil® 424 hydraulic fluid.

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

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

Hydraulic System Safety

⚠ WARNING

Hydraulic fluid escaping under pressure can penetrate skin and cause injury.

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

Checking the Hydraulic System

Service Interval: Before each use or daily

1. Move the machine on a level surface.
2. Release the traction pedal to the NEUTRAL position and start the engine. Run engine at lowest possible speed to purge the system of air. **Do not engage the PTO.**
3. Raise the deck to extend lift cylinders, shut off the engine, and remove the key.

4. Remove the hydraulic-fill cap (Figure 40) from the filler neck.
5. Remove the dipstick and wipe it with a clean rag (Figure 40).
6. Screw the dipstick all the way into the filler neck; then remove it and check level of fluid (Figure 40).

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

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

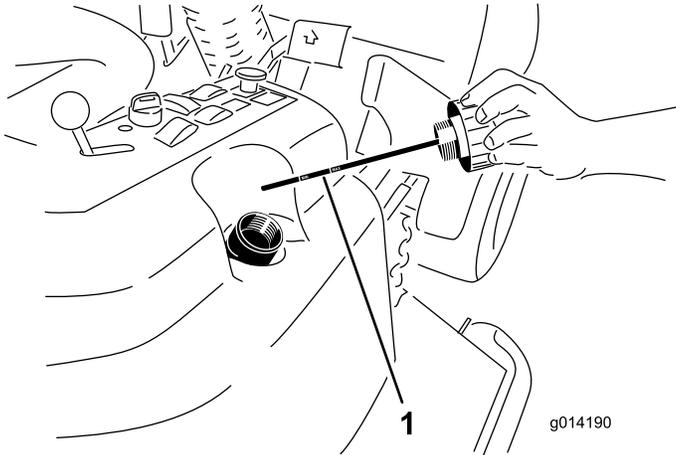


Figure 40

1. Dipstick

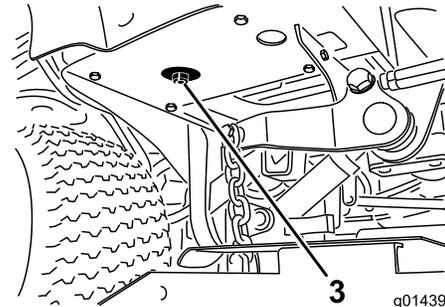
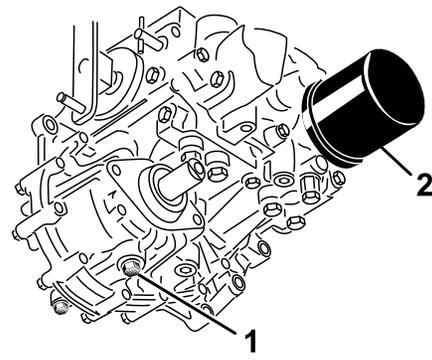


Figure 41

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

4. Clean the area around the hydraulic-fluid filter and remove it (Figure 41).
5. Immediately install a new hydraulic-fluid filter.
6. Install the hydraulic reservoir and transmission case drain plugs.
7. Fill the reservoir to the proper level (approximately 17 L or 18 US qt); refer to [Checking the Hydraulic System \(page 40\)](#).
8. Start the engine and check for leaks. Allow the engine to run for about 5 minutes, then shut it off.
9. After 2 minutes, check the level of the hydraulic fluid; refer to [Checking the Hydraulic System \(page 40\)](#).

Changing the Hydraulic Fluid and Filter

Service Interval: After the first 200 hours

Every 800 hours

1. Disengage the PTO, release the traction pedal to the NEUTRAL position and set the parking brake.
2. Move the throttle lever to the SLOW position, stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Place a large pan under the hydraulic reservoir and transmission case and remove the plugs to drain all the hydraulic fluid (Figure 41).

Storage

Servicing the Engine

1. Drain the engine oil from the oil pan and replace the drain plug.
2. Remove and discard the oil filter and install a new filter.
3. Refill the engine with 3.8 L (4.0 US qt) of recommended engine oil; refer to [Changing the Engine Oil and Filter \(page 31\)](#).
4. Start the engine and run it at idle speed for 2 minutes.
5. Drain the fuel from the fuel tank, fuel lines, pump, filter, and separator. Flush the fuel tank with clean diesel fuel and connect all fuel lines.
6. Thoroughly clean and service the air cleaner assembly.
7. Seal the air-cleaner inlet and the exhaust outlet with weatherproof masking tape.
8. Check the oil-filler cap and fuel-tank cap to ensure that they are securely in place.

Servicing the Machine

1. Thoroughly clean the machine, deck, and engine, paying special attention to the following areas:
 - Radiator and radiator screen
 - Counterbalance springs
 - PTO shaft assembly
 - All grease fittings and pivot points
 - Behind the control panel and inside the control box
 - Beneath the seat plate and top of the transmission
2. Check and adjust the front and rear tire pressure; refer to [Checking the Tire Pressure \(page 36\)](#).
3. Check all fasteners for looseness and tighten them as necessary.
4. Grease or oil all grease fittings, pivot points, and transmission bypass-valve pins. Wipe off any excess lubricant.
5. Lightly sand and use touch-up paint on painted areas that are scratched, chipped or rusted. Repair any dents in the metal body.
6. Service the battery and cables as follows:
 - A. Remove the battery terminals from the battery posts.
 - B. Clean the battery, terminals, and posts with a wire brush and baking-soda solution.
 - C. Coat the cable terminals and battery posts with Grafo 112X skin-over grease (Toro Part No. 505-47) or petroleum jelly to prevent corrosion.
 - D. Slowly charge the battery for 24 hours every 60 days to prevent lead sulfation of the battery.

International Distributor List

Distributor:	Country:	Phone Number:	Distributor:	Country:	Phone Number:
Agrolanc Kft	Hungary	36 27 539 640	Maquiver S.A.	Colombia	57 1 236 4079
Asian American Industrial (AAI)	Hong Kong	852 2497 7804	Maruyama Mfg. Co. Inc.	Japan	81 3 3252 2285
B-Ray Corporation	Korea	82 32 551 2076	Mountfield a.s.	Czech Republic	420 255 704 220
Brisa Goods LLC	Mexico	1 210 495 2417	Mountfield a.s.	Slovakia	420 255 704 220
Casco Sales Company	Puerto Rico	787 788 8383	Munditol S.A.	Argentina	54 11 4 821 9999
Ceres S.A.	Costa Rica	506 239 1138	Norma Garden	Russia	7 495 411 61 20
CSSC Turf Equipment (pvt) Ltd.	Sri Lanka	94 11 2746100	Oslinger Turf Equipment SA	Ecuador	593 4 239 6970
Cyril Johnston & Co.	Northern Ireland	44 2890 813 121	Oy Hako Ground and Garden Ab	Finland	358 987 00733
Cyril Johnston & Co.	Republic of Ireland	44 2890 813 121	Parkland Products Ltd.	New Zealand	64 3 34 93760
Fat Dragon	China	886 10 80841322	Perfetto	Poland	48 61 8 208 416
Femco S.A.	Guatemala	502 442 3277	Pratoverde SRL.	Italy	39 049 9128 128
FIVEMANS New-Tech Co., Ltd	China	86-10-6381 6136	Prochaska & Cie	Austria	43 1 278 5100
ForGarder OU	Estonia	372 384 6060	RT Cohen 2004 Ltd.	Israel	972 986 17979
G.Y.K. Company Ltd.	Japan	81 726 325 861	Riversa	Spain	34 9 52 83 7500
Geomechaniki of Athens	Greece	30 10 935 0054	Lely Turfcare	Denmark	45 66 109 200
Golf international Turizm	Turkey	90 216 336 5993	Lely (U.K.) Limited	United Kingdom	44 1480 226 800
Hako Ground and Garden	Sweden	46 35 10 0000	Solvart S.A.S.	France	33 1 30 81 77 00
Hako Ground and Garden	Norway	47 22 90 7760	Spypros Stavrinides Limited	Cyprus	357 22 434131
Hayter Limited (U.K.)	United Kingdom	44 1279 723 444	Surge Systems India Limited	India	91 1 292299901
Hydroturf Int. Co Dubai	United Arab Emirates	97 14 347 9479	T-Markt Logistics Ltd.	Hungary	36 26 525 500
Hydroturf Egypt LLC	Egypt	202 519 4308	Toro Australia	Australia	61 3 9580 7355
Irrimac	Portugal	351 21 238 8260	Toro Europe NV	Belgium	32 14 562 960
Irrigation Products Int'l Pvt Ltd.	India	0091 44 2449 4387	Valtech	Morocco	212 5 3766 3636
Jean Heybroek b.v.	Netherlands	31 30 639 4611	Victus Emak	Poland	48 61 823 8369

European Privacy Notice

The Information Toro Collects

Toro Warranty Company (Toro) respects your privacy. In order to process your warranty claim and contact you in the event of a product recall, we ask you to share certain personal information with us, either directly or through your local Toro company or dealer.

The Toro warranty system is hosted on servers located within the United States where privacy law may not provide the same protection as applies in your country.

BY SHARING YOUR PERSONAL INFORMATION WITH US, YOU ARE CONSENTING TO THE PROCESSING OF YOUR PERSONAL INFORMATION AS DESCRIBED IN THIS PRIVACY NOTICE.

The Way Toro Uses Information

Toro may use your personal information to process warranty claims, to contact you in the event of a product recall and for any other purpose which we tell you about. Toro may share your information with Toro's affiliates, dealers or other business partners in connection with any of these activities. We will not sell your personal information to any other company. We reserve the right to disclose personal information in order to comply with applicable laws and with requests by the appropriate authorities, to operate our systems properly or for our own protection or that of other users.

Retention of your Personal Information

We will keep your personal information as long as we need it for the purposes for which it was originally collected or for other legitimate purposes (such as regulatory compliance), or as required by applicable law.

Toro's Commitment to Security of Your Personal Information

We take reasonable precautions in order to protect the security of your personal information. We also take steps to maintain the accuracy and current status of personal information.

Access and Correction of your Personal Information

If you would like to review or correct your personal information, please contact us by email at legal@toro.com.

Australian Consumer Law

Australian customers will find details relating to the Australian Consumer Law either inside the box or at your local Toro Dealer.



The Toro Warranty

A Two-Year Limited Warranty

Conditions and Products Covered

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

* Product equipped with an hour meter.

Instructions for Obtaining Warranty Service

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

Toro Commercial Products Service Department
Toro Warranty Company
8111 Lyndale Avenue South
Bloomington, MN 55420-1196
952-888-8801 or 800-952-2740
E-mail: commercial.warranty@toro.com

Owner Responsibilities

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

Items and Conditions Not Covered

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

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

Countries Other than the United States or Canada

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

- Normal noise, vibration, wear and tear, and deterioration.
- Normal "wear and tear" includes, but is not limited to, damage to seats due to wear or abrasion, worn painted surfaces, scratched decals or windows, etc.

Parts

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

Deep Cycle and Lithium-Ion Battery Warranty:

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

Maintenance is at Owner's Expense

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

General Conditions

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

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

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

Note regarding engine warranty:

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