



Form No. 3385-253 Rev A

**Count on it.**

# Operator's Manual

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

Model No. 31230N—Serial No. 313000001 and Up



## ⚠ 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.

Because in some areas there are local, state, or federal regulations requiring that a spark arrester be used on the engine of this machine, a spark arrester is available as an option. If you require a spark arrester, contact your Authorized Toro Service Dealer.

Genuine Toro spark arresters are approved by the USDA Forestry Service.

**Important:** It is a violation of California Public Resource Code Section 4442 to use or operate the engine on any forest-covered, brush-covered, or grass-covered land without a spark arrester muffler maintained in working order, or the engine constricted, equipped, and maintained for the prevention of fire. Other states or federal areas may have similar laws.

## Introduction

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

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

You may contact Toro directly at [www.Toro.com](http://www.Toro.com) for product and accessory information, help finding a dealer, or to register your product.

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

model and serial numbers on the product. Write the numbers in the space provided.

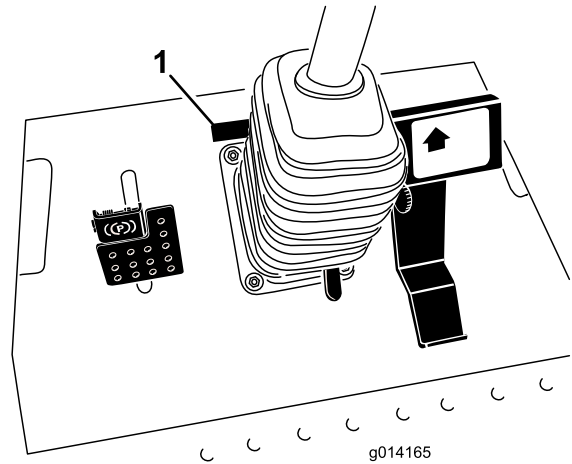


Figure 1

1. Model and serial number location

Model No. \_\_\_\_\_

Serial No. \_\_\_\_\_

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



Figure 2

1. Safety alert symbol

This manual also uses 2 words to highlight information.

**Important** calls attention to special mechanical information and **Note** emphasizes general information worthy of special attention.

# Contents

Introduction .....	2
Safety .....	4
Safe Operating Practices .....	4
Toro Riding Mower Safety .....	5
Safety and Instructional Decals .....	6
Setup .....	11
1 Adjusting the ROPS .....	11
2 Checking the Tire Pressure .....	11
3 Checking the Fluid Levels .....	12
Product Overview .....	12
Controls .....	12
Specifications .....	14
Attachments/Accessories .....	14
Operation .....	14
Adding Fuel .....	14
Filling the Fuel Tank .....	15
Using the Rollover Protection System (ROPS) .....	15
Think Safety First .....	16
Starting and Stopping the Engine .....	16
Driving the Machine .....	17
Stopping the Machine .....	18
Operating the Mower .....	18
The Safety Interlock System .....	18
Positioning the Standard Seat .....	19
Positioning the Deluxe Seat .....	20
Raising/Lowering the Seat .....	21
Pushing the Machine by Hand .....	22
Loading Machines .....	22
Transporting Machines .....	23
Operating Tips .....	24
Maintenance .....	26
Recommended Maintenance Schedule(s) .....	26
Daily Maintenance Checklist .....	27
Premaintenance Procedures .....	28
Using the Hood Prop Rod .....	28
Lubrication .....	28
Greasing the Bearings and Bushings .....	28
Engine Maintenance .....	30
Servicing the Air Cleaner .....	30
Checking the Engine Oil Level .....	30
Changing the Engine Oil and Filter .....	31
Adjusting the Throttle .....	31
Fuel System Maintenance .....	32
Servicing the Water Separator .....	32
Bleeding the Fuel System .....	32
Bleeding Air from the Fuel Injectors .....	33
Cleaning the Fuel Tank .....	33
Fuel Lines and Connections .....	33
Electrical System Maintenance .....	34
Checking the Fuses .....	34
Servicing the Battery .....	34
Storing the Battery .....	35
Drive System Maintenance .....	35
Checking the Tire Pressure .....	35
Cooling System Maintenance .....	36
Checking the Cooling System .....	36

Cleaning the Radiator .....	36
Brake Maintenance .....	37
Adjusting the Service Brakes .....	37
Adjusting the Parking Brake .....	37
Belt Maintenance .....	38
Checking the Alternator Belt .....	38
Controls System Maintenance .....	39
Adjusting the Traction Drive for Neutral .....	39
Adjusting the Maximum Ground Speed .....	39
Adjusting the Mow Speed Limiter Lever .....	40
Hydraulic System Maintenance .....	41
Checking the Hydraulic System .....	41
Changing the Hydraulic Oil And Filter .....	41
Storage .....	42
Engine .....	42
Machine .....	42

# Safety

This machine meets or exceeds ANSI B71.4-2012 specifications in effect at the time of production.

Improper use or maintenance by the operator or owner 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 the instruction may result in personal injury or death.

## Safe Operating Practices

The following instructions are adapted from ANSI B71.4-2012.

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

## Training

- Read the *Operator's Manual* and other training material carefully. Be familiar with the controls, safety signs, and the proper use of the equipment.
- Never allow children or people unfamiliar with these instructions to use the lawn machine. Local regulations can restrict the age of the operator.
- Never mow while people, especially children, or pets are nearby.
- Keep in mind that the operator or user is responsible for accidents or hazards occurring to other people or their property.
- Do not carry passengers.
- All drivers should seek and obtain professional and practical instruction. Such instruction should emphasize:
  - the need for care and concentration when working with ride-on machines;
  - control of a ride-on machine sliding on a slope will not be regained by the application of the brake. The main reasons for loss of control are:
    - ◇ insufficient wheel grip, especially on wet grass;
    - ◇ being driven too fast;
    - ◇ inadequate braking;
    - ◇ the type of machine is unsuitable for its task;
    - ◇ lack of awareness of the effect of ground conditions, especially slopes;
    - ◇ incorrect load distribution.

## Preparation

- While mowing, always wear substantial footwear and long trousers. Do not operate the equipment when barefoot or wearing open sandals.

- Thoroughly inspect the area where the equipment is to be used and remove all objects which may be thrown by the machine.
- Replace faulty silencers/mufflers.
- Before using, always visually inspect to see that the blades, blade bolts and cutter assembly are not worn or damaged. Replace worn or damaged blades and bolts in sets to preserve balance.

## Safe Handling of Fuels

- To avoid personal injury or property damage, use extreme care in handling gasoline. Gasoline is extremely flammable and the vapors are explosive.
- Extinguish all cigarettes, cigars, pipes, and other sources of ignition.
- Use only an approved fuel container.
- Never remove fuel cap or add fuel with the engine running.
- Allow engine to cool before refueling.
- Never refuel the machine indoors.
- 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.
- Never fill containers inside a vehicle or on a truck or trailer bed with a plastic liner. Always place containers on the ground away from your vehicle before filling.
- Remove equipment from the truck or trailer and refuel it on the ground. If this is not possible, then refuel such equipment with a portable container, rather than from a fuel dispenser nozzle.
- Keep the nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete. Do not use a nozzle lock open device.
- If fuel is spilled on clothing, change clothing immediately.
- Never overfill fuel tank. Replace fuel cap and tighten securely.

## Operation

- Be alert, slow down and use caution when making turns. Look behind and to the side before changing directions.
- Do not operate the engine in a confined space where dangerous carbon monoxide fumes can collect.
- Mow only in daylight or in good artificial light.
- Before attempting to start the engine, disengage all blade attachment clutches and shift into neutral.
- Remember there is no such thing as a safe slope. Travel on grass slopes requires particular care. To guard against overturning:
  - do not stop or start suddenly when on a slope;
  - use slow speeds on slopes and during tight turns;

- stay alert for humps and hollows and other hidden hazards;
- Watch out for traffic when crossing or near roadways.
- Stop the blades from rotating before crossing surfaces other than grass.
- When using any attachments, never direct discharge of material toward bystanders nor allow anyone near the machine while in operation.
- Never operate the machine with damaged guards, shields, or without safety protective devices in place.
- Do not change the engine governor settings or overspeed the engine. Operating the engine at excessive speed may increase the hazard of personal injury.
- Before leaving the operator's position:
  - disengage the power take-off and lower the attachments;
  - set the parking brake;
  - stop the engine and remove the key.
- Disengage drive to attachments, stop the engine, and remove the ignition key:
  - before clearing blockages or unclogging chute;
  - before checking, cleaning or working on the machine;
  - after striking a foreign object. Inspect the machine for damage and make repairs before restarting and operating the equipment;
  - if the machine starts to vibrate abnormally (check immediately).
- Do not operate the machine under the influence of alcohol or drugs.
- Lightning can cause severe injury or death. If lightning is seen or thunder is heard in the area, do not operate the machine; seek shelter.
- Disengage drive to attachments when transporting or not in use.
- Stop the engine and disengage drive to attachment before refueling.

## Rollover Protection System (ROPS) - Use and Maintenance

- The ROPS is an integral and effective safety device. Keep a folding ROPS in the raised and locked position and use the seat belt when operating the machine.
- Lower a folding ROPS temporarily only when absolutely necessary. Do not wear the seat belt when folded down.
- Be aware there is no rollover protection when a folded ROPS is in the down position.
- Be certain that the seat belt can be released quickly in the event of an emergency.
- Check the area to be mowed and never fold down a folding ROPS in areas where there are slopes, drop offs or water.

- Check carefully for overhead clearances (i.e. branches, doorways, electrical wires) before driving under any objects and do not contact them.
- Keep the ROPS in safe operating condition by periodically thoroughly inspecting for damage and keeping all mounting fasteners tight.
- Replace a damaged ROPS. Do not repair or revise.
- **Do not** remove the ROPS.
- Any alterations to a ROPS must be approved by the manufacturer.

## Maintenance and Storage

- Keep all nuts, bolts and screws tight to be sure the equipment is in safe working condition.
- Never store the equipment with fuel in the tank inside a building where fumes may reach an open flame or spark.
- Allow the engine to cool before storing in any enclosure.
- To reduce the fire hazard, keep the engine, silencer/muffler, battery compartment and fuel storage area free of grass, leaves, or excessive grease.
- Replace worn or damaged parts for safety.
- If the fuel tank has to be drained, do this outdoors.
- On multi-bladed machines, take care as manually rotating one blade can cause other blades to rotate.
- When machine is to be parked, stored or left unattended, lower the mower deck.

## Hauling

- Use care when loading or unloading the machine into a trailer or truck.
- Use full width ramps for loading machine into trailer or 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

## Toro Riding Mower Safety

The following list contains safety information specific to Toro products or other safety information that you must know that is not included in the standard.

- Engine exhaust contains carbon monoxide, which is an odorless, deadly poison that can kill you. Do not run engine indoors or in an enclosed area.
- Keep hands, feet, hair and loose clothing away from attachment discharge area, underside of mower and any moving parts while engine is running.
- Do not touch equipment or attachment parts which may be hot from operation. Allow to cool before attempting to maintain, adjust, or service.

- Battery acid is poisonous and can cause burns. Avoid contact with skin, eyes and clothing. Protect your face, eyes, and clothing when working with a battery.
- This machine is not designed or equipped for on-road use and is a “slow-moving vehicle.” If you must cross or travel on a public road, you should be aware of and comply with local regulations, such as required lights, slow moving vehicle signs, and reflectors.
- Battery gases can explode. Keep cigarettes, sparks and flames away from battery.
- Use only genuine Toro replacement parts to ensure that original standards are maintained.
- Use only Toro approved attachments. Warranty may be voided if used with unapproved attachments.

## Slope Operation

- Do not mow near drop-offs, ditches, steep banks or water. Wheels dropping over edges can cause rollovers, which may result in serious injury, death, or drowning.
- Do not mow slopes when grass is wet. Slippery conditions reduce traction and could cause sliding and loss of control.
- Do not make sudden turns or rapid speed changes.
- Use a walk behind mower and/or a hand trimmer near drop-offs, ditches, steep banks or water.
- Reduce speed and use extreme caution on slopes.
- Remove or mark obstacles such as rocks, tree limbs, etc. from the mowing area. Tall grass can hide obstacles.
- Watch for ditches, holes, rocks, dips, and rises that change the operating angle, as rough terrain could overturn the machine.

- Avoid sudden starts when mowing uphill because the machine may tip backwards.
- Be aware that loss of traction may occur going downhill. Weight transfer to the front wheels may cause drive wheels to slip and cause loss of braking and steering.
- Always avoid sudden starting or stopping on a slope. If tires lose traction, disengage the blades and proceed slowly off the slope.
- Follow the manufacturer's recommendations for wheel weights or counterweights to improve stability.
- Use extreme care with attachments. These can change the stability of the machine and cause loss of control.

## 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.
- Be certain that the seat belt can be released quickly in the event of an emergency.
- Be aware there is no rollover protection when the roll bar is down.
- Check the area to be mowed and never fold the ROPS in areas where there are slopes, drop offs or water.
- Lower the rollbar only when absolutely necessary. **Do not wear the seat belt with the roll bar folded down.**
- Check carefully for overhead clearances (i.e. branches, doorways, electrical wires) before driving under any objects and do not contact them.

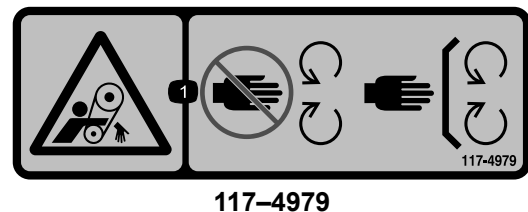
## Safety and Instructional Decals



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.



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



1. Rotating belt — Keep guard in place



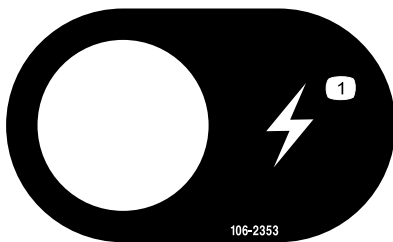
117-3276

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*.



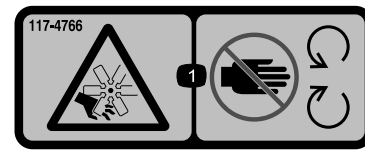
117-3272

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.



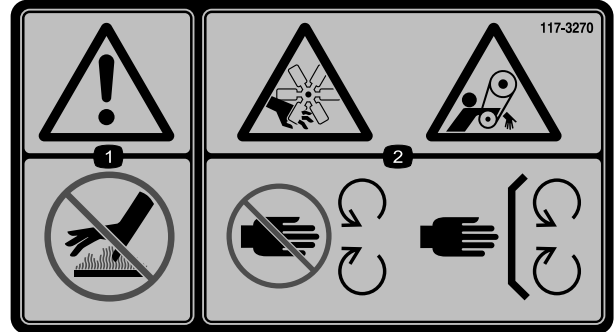
106-2353

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

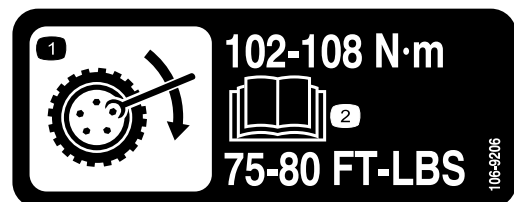
1. Warning—do not touch the hot surface.
2. Cutting/dismemberment hazard, hand; entanglement hazard, belt—stay away from moving parts, keep all guards and shields in place.

#### 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.

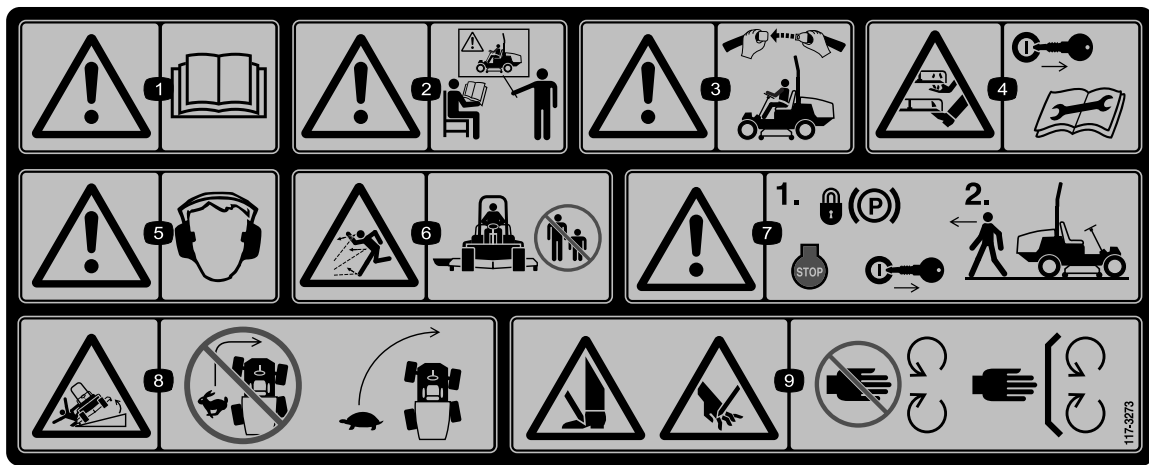
117-2718

117-2718



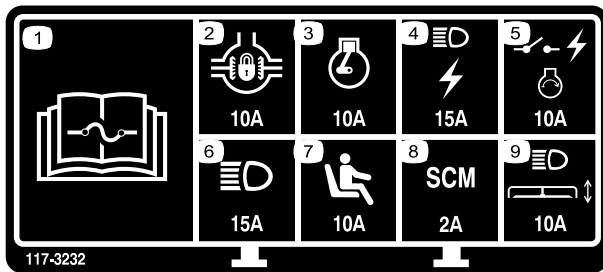
106-9206

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



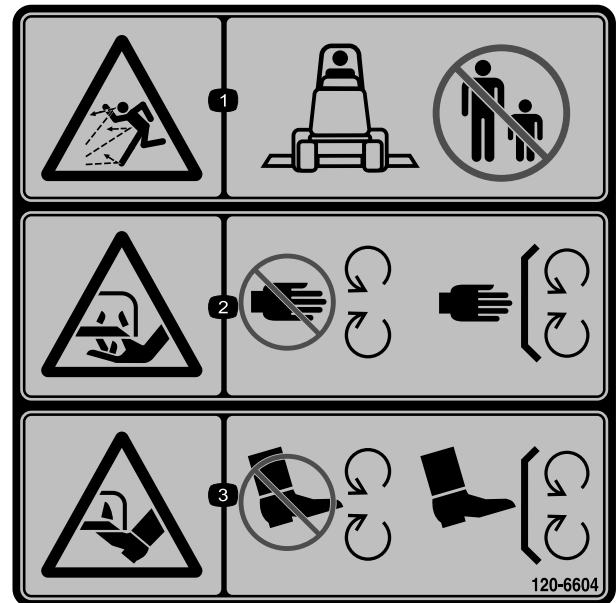
117-3273

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 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

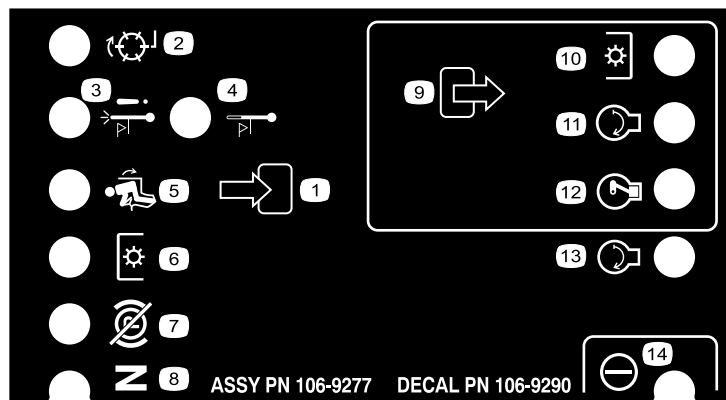
1. Read the *Operator's Manual* for information on fuses.
2. Differential lockout—10 amp
3. Engine—10 amp
4. Lights, power point—15 amp
5. Power switch, engine ignition—10 amp
6. Lights—15 amp
7. Operator presence switch—10 amp
8. Computer—2 amp
9. Headlights, deck actuator—10 amp



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 Take-off (PTO) | 10. Power Take Off (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)**

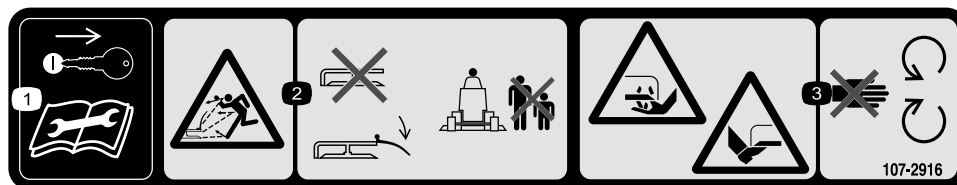
1. OIL LEVEL, ENGINE	6. RADIATOR SCREEN
2. OIL LEVEL, HYDRAULIC TANK	7. BRAKE FUNCTION
3. COOLANT LEVEL, RADIATOR	8. TIRE PRESSURE
4. FUEL /WATER SEPARATOR	9. BATTERY
5. PRECLEANER - AIR CLEANER	10. BELTS - DECK, FAN, ALTERNATOR
	11. GEARBOX
	GREASING - SEE OPERATOR'S MANUAL

**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 3 CYL - 1.1L	SAE 15W-40*	5.5 QTS. (5.2 LITERS) 3.9 QTS. (3.7 LITERS)	150 HRS.	150 HRS.	108-3841
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.			

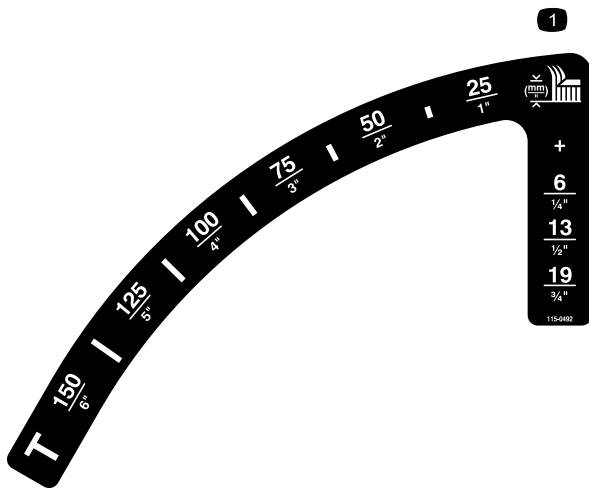
\*SEE OPERATOR'S MANUAL FOR INITIAL CHANGES / WINTER USE.

120-0259



107-2916

- |  |   |   |
|--|---|---|
| 1. Remove the ignition key and read the <i>Operator's Manual</i> 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

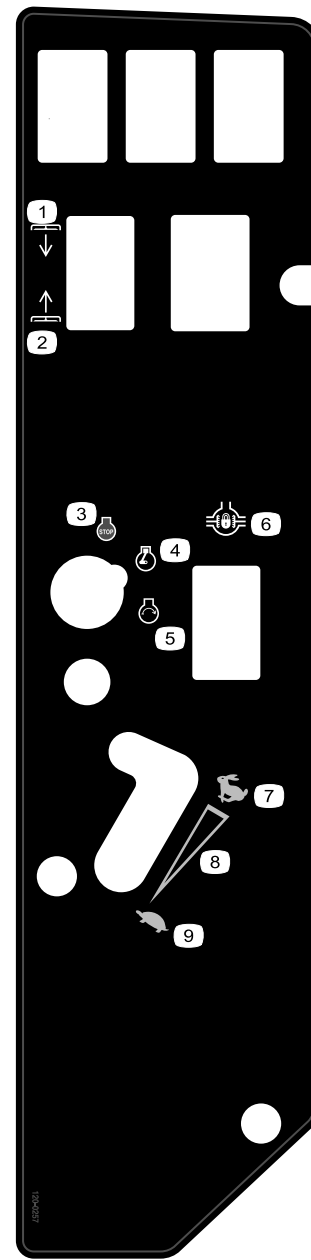
1. Height of cut (mm)



#### 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
<b>1</b>	No parts required	–	Adjust the ROPS
<b>2</b>	No parts required	–	Check the tire pressure.
<b>3</b>	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 reference part numbers
Operator Training Material	1	View the video before operating the machine

# 1

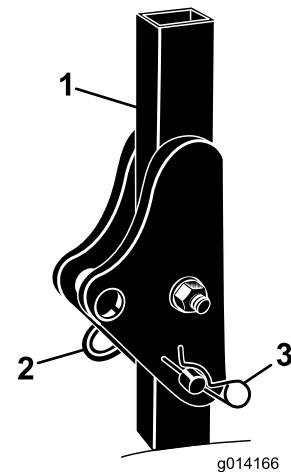
## Adjusting the ROPS

### No Parts Required

#### Procedure

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

# 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 installed 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 Fluid Level in the Maintenance Section.
2. Check the engine oil level before starting the engine, refer to Checking the Engine Oil Level in the Maintenance Section.
3. Check the cooling system before starting the engine; refer to Checking the Cooling System in the Maintenance Section.

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

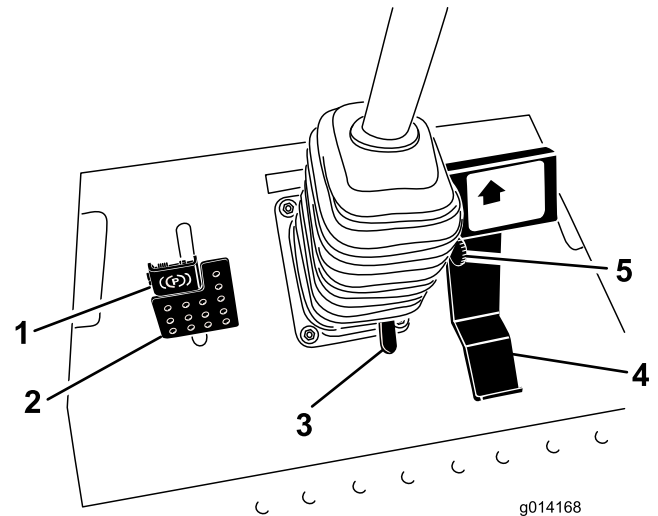


Figure 4

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

### Mow Speed Limiter

The mow speed limiter lever (Figure 4) can be flipped forward to limit the traction speed while operating.

### Brake Pedal

The brake pedal is used in conjunction 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. The brake can assist in stopping in an emergency situation.

### Parking Brake

To engage the parking brake, push down on the brake pedal and press the top forward to latch (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 towards you, press the foot pedal down, and pull the steering tower toward you to the most comfortable position and then release the pedal (Figure 4).

## Ignition Switch

The ignition switch has three positions: Off, On/Preheat, and Start (Figure 5).

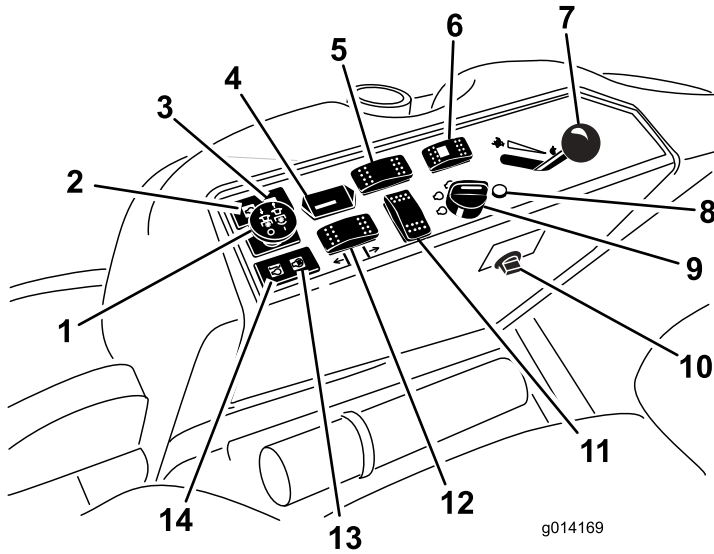


Figure 5

- |  |  |
|--|--|
| 1. Power take off (PTO) Switch                   | 8. Diagnostic light (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. Engine coolant temperature warning light |

## Throttle Lever

The throttle lever (Figure 5) controls the speed of the engine. 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, in conjunction with the traction pedal, controls ground speed of the machine. Always run the machine with the throttle in the Fast position when cutting grass.

## Power Take Off (PTO) Switch

The power take off (PTO) switch starts and stops the mower blades (Figure 5).

## Hour Meter

The hour meter (Figure 5) records the number of hours 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 Light (Orange Light)

The glow plug indicator light (Figure 5) turns on when the ignition switch is turned to the On position. It remains lit for 6 seconds. When the light turns off, the engine is ready to be started.

## Engine Coolant Temperature Warning Light

This light glows and the attachment stops if the engine coolant temperature is high (Figure 5). If the machine is not stopped and the coolant temperature rises another 20° F, the engine will stop.

**Important:** If the attachment shuts down and the temperature warning light is on, push PTO knob down, drive 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. Stop the engine and check the cooling system; refer to Checking the Cooling System.

## Charge Indicator

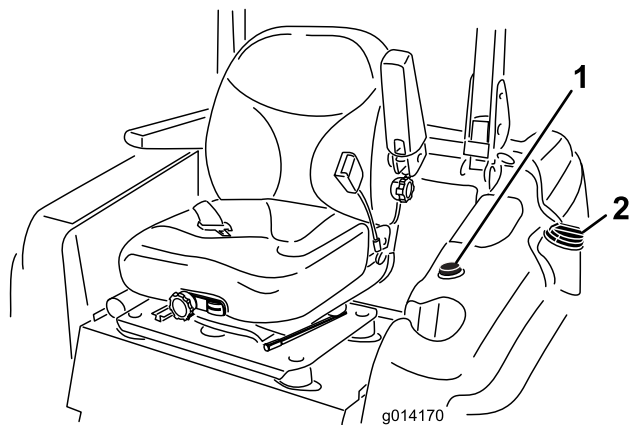
Illuminates when the charging system circuit malfunctions (Figure 5).

## 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, stop the engine and determine the cause. Repair the damage before starting the engine again.

## Fuel Gauge

The fuel gauge (Figure 6) indicates the fuel level 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)
Height (with Roll Bar Down)	54 inches (137.2 cm)
Weight	2187 lb (992 kg)

## 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](http://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.

## ⚠ CAUTION

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

**Wear hearing protection when operating this machine.**

## Adding 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 can be used within 180 days to ensure fuel freshness.

**Fuel tank capacity:** 51.1liters (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. Use of winter grade fuel at lower temperatures provides lower flash point and cold flow characteristics which will ease starting and reduce fuel filter plugging.

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

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

## ⚠ 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 face away from nozzle and fuel tank or conditioner opening.
- Keep fuel away from eyes and skin.

### Biodiesel Ready

This machine can also use a biodiesel blended fuel of up to B20 (20% biodiesel, 80% petrodiesel). The petrodiesel portion should be low or 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.
- Painted surfaces may be damaged by biodiesel blends.

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

## ⚠ 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 30-day supply of fuel.
- Do not operate without entire exhaust system in place and in proper working condition.

## ⚠ DANGER

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

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

## Filling the Fuel Tank

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

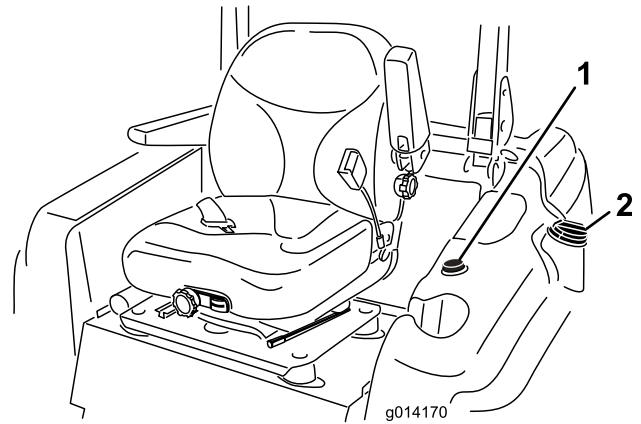


Figure 7

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 over fill the fuel tank.**
5. Install the fuel tank cap and secure. Wipe up any fuel that may have spilled.

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

## 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.
- Be certain that the seat belt can be released quickly in the event of an emergency.
- Be aware there is no rollover protection when the roll bar is down.
- Check the area to be mowed and never fold the ROPS in areas where there are slopes, drop offs or water.
- Lower the rollbar only when absolutely necessary. **Do not wear the seat belt with the roll bar folded down.**
- Check carefully for overhead clearances (i.e. branches, doorways, electrical wires) before driving under any objects and do not contact them.

## ⚠ 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

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

- Lower the roll bar only when absolutely necessary.
  - Do not wear the seat belt when the roll bar is in the down position.
  - Drive slowly and carefully.
  - Raise the roll bar as soon as clearance permits.
  - Check carefully for overhead clearances (i.e. branches, doorways, electrical wires) before driving under any objects and do not contact them.
1. To lower the roll bar, remove the hairpin cotters, push the roll bar forward against the springs, and remove the two pins (Figure 8).

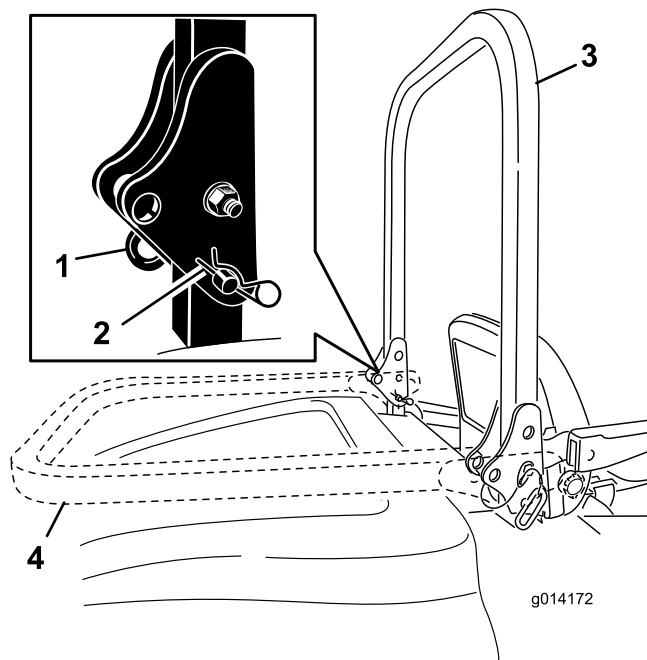


Figure 8

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

**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 two pins (Figure 8).
5. Raise the roll bar to the upright position and install the two pins and secure them with the hairpin cotter pins (Figure 8).

**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.

## Think Safety First

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

## ⚠ DANGER

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

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

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

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

Read and follow the rollover protection instructions and warnings.

To avoid loss of control and possibility of rollover:

- Do not operate near drop-offs or near water.
- Reduce speed and use extreme caution on slopes.
- Avoid sudden turns or rapid speed changes.

## ⚠ CAUTION

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

Wear hearing protection when operating this machine.

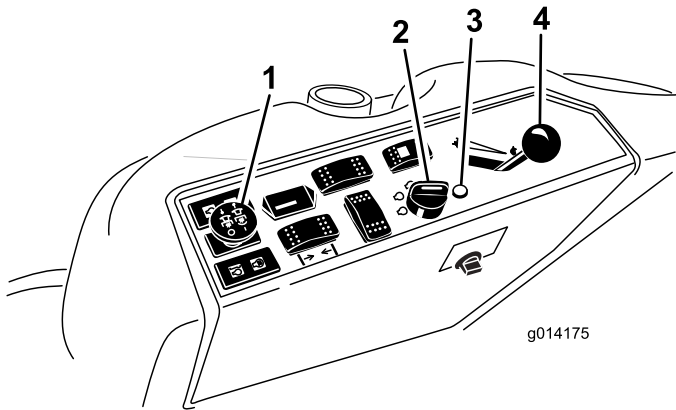
## Starting and Stopping the Engine

### Starting the Engine

1. Raise the roll bar up and lock it into place, sit on the seat, and fasten the seat belt.



2. Make sure the traction pedal is in the neutral position.
3. Set the parking brake.
4. Move the PTO (power take off) switch to the off position (Figure 9).

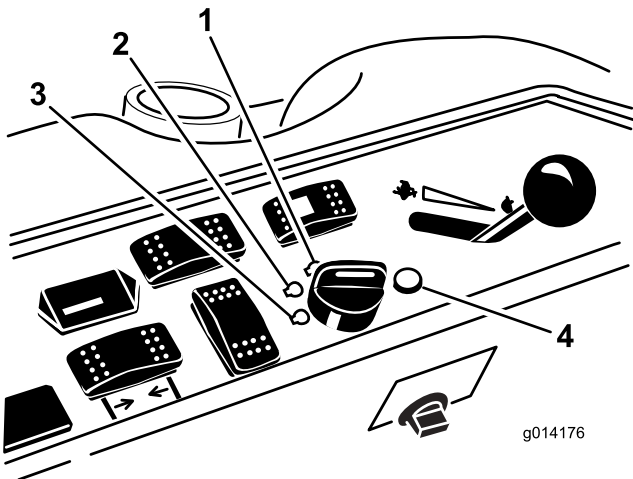


**Figure 9**

- |                                |                    |
|--------------------------------|--------------------|
| 1. Power take off 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 9).
6. Turn the ignition key clockwise to the Run position (Figure 10).

The glow plug light will turn on for 6 seconds.



**Figure 10**

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

7. After the glow plug indicator light goes out, 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:** Additional starting cycles may be required when starting the engine for the first time after the fuel system has been completely drained.

8. Leave the throttle midway between the Slow and Fast positions until the engine and hydraulic system warm up.

**Important:** When engine is started for the first time, or after an engine oil change, or an overhaul of 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 one to two minutes. Also operate the lift lever and PTO lever to ensure proper operation of all parts. Then shut the engine off and check fluid levels, check for oil leaks, loose parts, and any other noticeable malfunctions.

### **⚠ CAUTION**

Shut the engine off and wait for all moving parts to stop before checking for oil leaks, loose parts, or other malfunctions.

## **Stopping the Engine**

1. Disengage the PTO, make sure the traction pedal is in the neutral position, set the parking brake, and move the throttle lever to the Slow position.
2. Let the engine idle for 60 seconds.
3. Turn the ignition key to the Off position (Figure 10). Wait for all moving parts to stop before leaving the operating position.
4. Remove the key before transporting or storing machine.

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

### **⚠ CAUTION**

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

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

## **Driving the Machine**

The throttle control regulates the engine speed as measured in rpm (revolutions per minute). Place the throttle control in the Fast position for best performance. Always operate in the Fast throttle position when 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. Remember to remove the key from the ignition switch.

## ⚠ CAUTION

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

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

# Operating the Mower

## Raising and Lowering the Mower

The deck lift switch raises and lowers the mower deck (Figure 11). The engine must be running for you to use this switch.

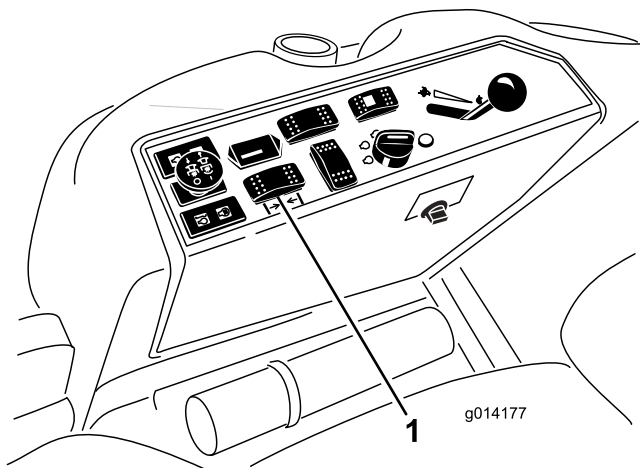


Figure 11

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 Take Off (PTO)

The power take off (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, make sure the traction pedal is in the neutral position and the engine is at full throttle.

3. Pull up on the PTO switch to engage it (Figure 12).

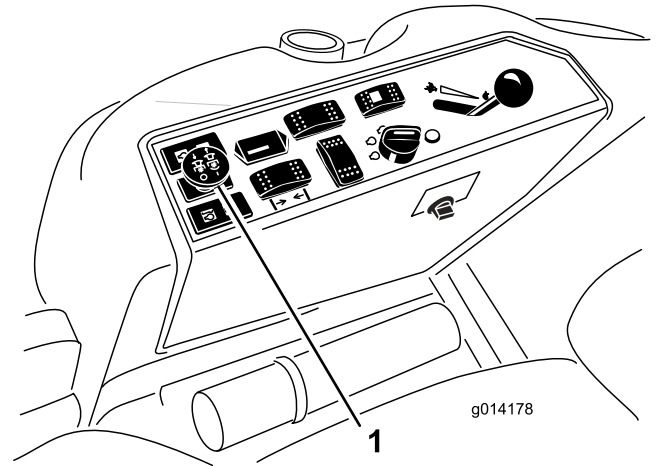


Figure 12

1. PTO switch

## Disengaging the PTO

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

# 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:

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

The safety interlock system also is designed to stop the engine when the traction pedal is moved 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 stops.

## Testing the Safety Interlock System

**Service Interval:** Before each use or daily

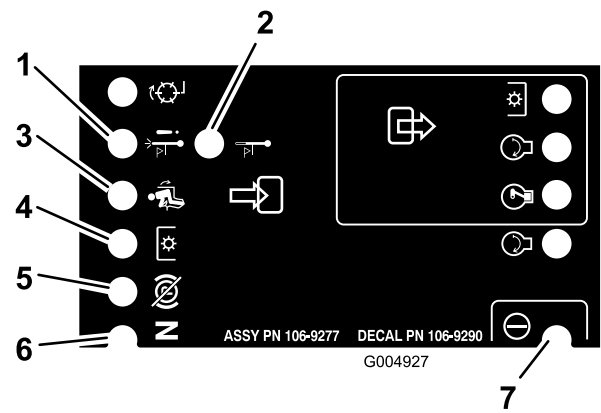
Test the safety interlock system before you use the machine each time. If the safety system does not operate as described below, have an Authorized Service Dealer repair the safety system immediately.

1. Sitting on the seat, engage the parking brake and move the PTO to on. Try starting the engine; the engine should not crank.
2. Sitting on the seat, engage the parking brake and move the PTO to off. Engage the traction pedal. Try starting the engine; the engine should not crank.
3. Sitting on the seat, engage the parking brake, move the PTO switch to off and allow the traction pedal to return to the neutral position. Now start the engine. While the engine is running, release the parking brake, engage the PTO and rise slightly from the seat. On two wheel drive machines, the engine should stop within 2 seconds. On four wheel drive machines, the mower deck will shut off. The engine will continue to run.
4. Without an operator on the seat, engage the parking brake, move the PTO switch to off and move the traction pedal to the neutral position. Now start the engine. While the engine is running, engage the traction pedal; the engine should stop within 2 seconds.
5. Without an operator on the seat, disengage the parking brake, move the PTO switch to off, and allow the traction pedal to return to the neutral position. Try starting the engine; the engine should not crank.

## Using the SCM to Diagnose System Problems

The machine is equipped with a standard control module (SCM) monitoring system that tracks the function of various key systems. The SCM is located under the seat.

On the face of the SCM are 11 LEDs that illuminate to indicate various system conditions. Seven of these lights can be used by the operator for system diagnosis. Refer to Figure 13 for a description of what each light means. For details on using the rest of the SCM functions, refer to the *Service Manual*, available through your Authorized Toro Distributor.



**Figure 13**

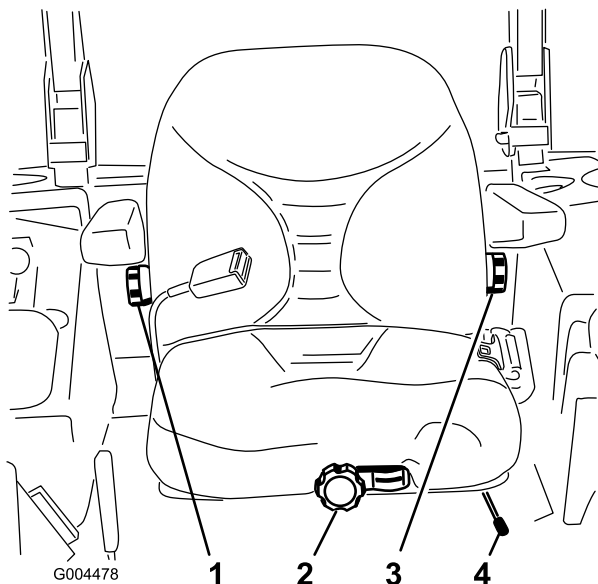
1. High temperature shutdown—the engine temperature has exceeded safe levels and the engine has been shut down. Check the cooling system.
2. High temperature warning—the engine temperature is approaching unsafe levels and the mower deck has been shut down. Check the cooling system.
3. Operator is in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

## Positioning the 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, move the lever sideways to unlock the seat (Figure 14).



**Figure 14**

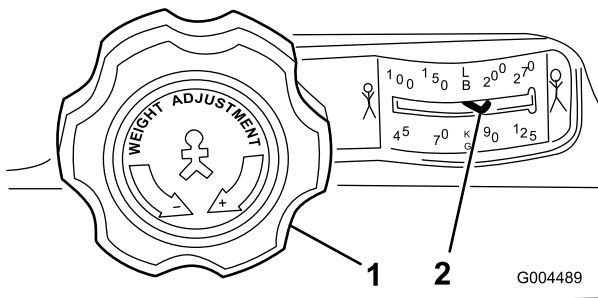
- |                         |                                   |
|-------------------------|-----------------------------------|
| 1. Back rest knob       | 3. Lumbar support adjustment knob |
| 2. Seat suspension knob | 4. Seat position adjustment lever |

2. Slide the seat to the desired position and release lever to lock in position.
3. Verify that the seat has locked into place by attempting to move it back and forth.

## Changing the Seat Suspension

The seat can be adjusted 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 either direction to provide the best comfort (Figure 14).



**Figure 15**

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

## Changing the Back Position

The back of the seat can be adjusted to provide a comfortable ride. Position the back of the seat where it is most comfortable.

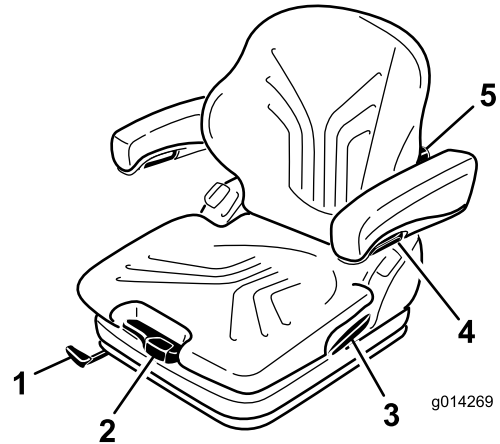
To adjust it, turn the knob, under the right-side arm rest, in either direction to provide the best comfort (Figure 14).

## Changing the Lumbar Support

The back of the seat can be adjusted to provide a customized lumbar support for your lower back.

To adjust it, turn the knob, under the left-side arm rest, in either direction to provide the best comfort (Figure 14).

## Positioning the Deluxe Seat



**Figure 16**

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

## Changing the Weight Adjustment

The seat can be adjusted to provide a smooth and comfortable ride.

**Important:** To adjust the seat for the drivers weight the driver must be seated and the ignition key moved to the On position.

The seat is adjusted for the driver's weight by pulling or pressing the weight adjustment lever (Figure 16).

The driver's weight is adjusted correctly when the arrow is in the middle clear area of the viewing window.

Within this viewing area, the seat can be adjusted to a minimum spring movement.

When the minimum/maximum weight adjustment has been reached, you can hear it reaching the upper or lower end stop.

**Important:** To prevent injury to the operator and/or damage to the machine, the setting for the driver's weight and the seat must be checked and adjusted before the machine is operated.

**Note:** To avoid compressor damage during weight adjustment, the compressor must be operated no 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. To adjust, lift the lever to unlock the seat (Figure 16).
2. Slide the seat to the desired position and release lever to lock in 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 the seating comfort and the performance of the driver.

The back of the seat can be adjusted to provide a customized lumbar support for your lower back.

By turning the adjustment knob upwards, the curvature in the upper part of the backrest cushion can be adjusted. By turning the knob downwards, the curvature in the lower part of the backrest cushion can be adjusted (Figure 16).

0 = No curvature

1 = Maximum curvature at the top

2 = Maximum curvature at the bottom

## Adjusting the Armrests

The armrests can be folded back if required and the height individually adjusted.

To adjust the armrests for height, separate the round cap (Figure 16) from the cover, loosen the hexagon nut (13 mm) behind it and adjust the armrests to the desired position and tighten the nut. Replace the cap onto the nut.

### **⚠ WARNING**

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

## Changing the Armrest Angle

The angle of the armrests can be adjusted for operator comfort.

To adjust the angle of the armrests, turn the adjustment knob (Figure 16).

When turning the knob to the outside (+) the front part of the armrest will be lifted, when turning the knob to inside (-) it will be lowered.

## Changing the Backrest Position

The back of the seat can be adjusted 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 16). When releasing the backrest catch, do not apply load to the backrest by pressing against it.

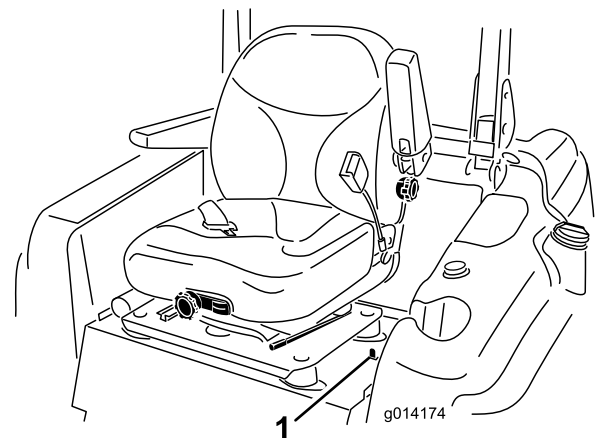
By exerting pressure on or off the front or rear of the seat it can be moved to the desired position. Release the locking lever to lock the backrest.

**Note:** The backrest should not be able to move the into another position after it has been locked.

## Raising/Lowering the Seat

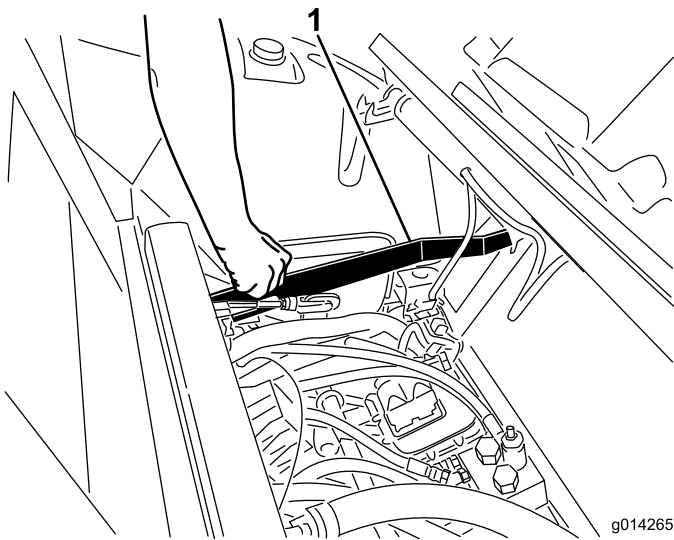
To access the hydraulic and other systems under the seat, you need to unlatch the seat and swing it forward.

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 17).



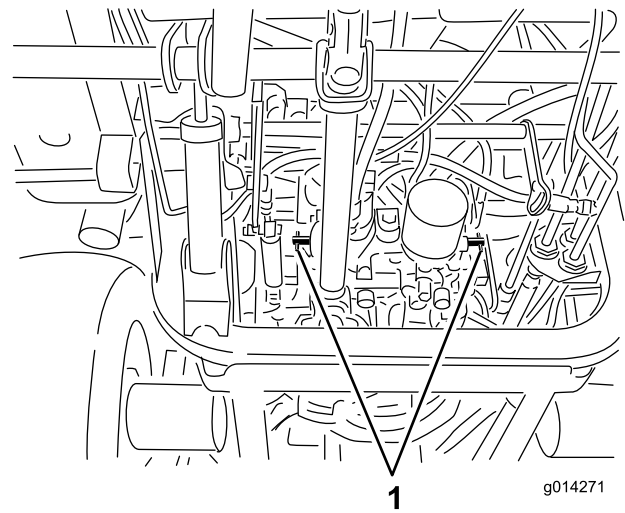
**Figure 17**

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



**Figure 18**

1. Seat latch release bar



**Figure 19**

1. By-pass valves

## Pushing the Machine by Hand

If the machine stalls, runs out of fuel, etc. you may need to push it. To do so, you first need to open both of the hydraulic by-pass valves.

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

### Pushing the Machine

1. Disengage the power take off (PTO), turn the ignition key to off and apply the parking brake.
2. Remove the key from the ignition switch. **Both by-pass valves must be opened.**
3. Lift the seat.
4. Rotate each by-pass valve counterclockwise 1 turn (Figure 19).

This allows hydraulic fluid to by-pass the pump enabling the wheels to turn.

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

5. Disengage the parking brake before pushing.

## Changing to Machine Operation

Rotate each by-pass valve clockwise 1 turn and hand tighten them (torque of approximately 71 in-lb (8 N-m)) (Figure 19).

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

The machine will not drive unless the by-pass valves are turned in.

## Loading Machines

Use extreme caution when loading units on trailers or trucks. One full width ramp that is wide enough to extend beyond the rear tires is recommended instead of individual ramps for each side of the unit (Figure 20). The lower rear section of the tractor frame extends back between the rear wheels and serves as a stop for tipping backward. Having a full width ramp provides a surface for the frame members to contact if the unit starts to tip backward. If it is not possible to use one full width ramp, use enough individual ramps to simulate a full width continuous ramp.

The ramp should be long enough so that the angles do not exceed 15 degrees (Figure 20). A steeper angle may cause machine components to get caught as the unit moves from ramp to trailer or truck. Steeper angles may also cause the unit to tip backward. If loading on or near a slope, position the trailer or truck so it is on the down side of the slope and the ramp extends up the slope. This will minimize the ramp angle. The trailer or truck should be as level as possible.

**Important:** Do not attempt to turn the unit while on the ramp; you may lose control and drive off the side.

Avoid sudden acceleration when driving up a ramp and sudden deceleration when backing down a ramp. Both maneuvers can cause the unit to tip backward.

## ⚠ WARNING

Loading a unit onto a trailer or truck increases the possibility of backward tip-over and could cause serious injury or death.

- Use extreme caution when operating a unit on a ramp.
- Use only a single, full width ramp; Do not use individual ramps for each side of the unit.
- If individual ramps must be used, use enough ramps to create an unbroken ramp surface wider than the unit.
- Do not exceed a 15 degree angle between ramp and ground or between ramp and trailer or truck.
- Avoid sudden acceleration while driving unit up a ramp to avoid tipping backward.
- Avoid sudden deceleration while backing unit down a ramp to avoid tipping backward.

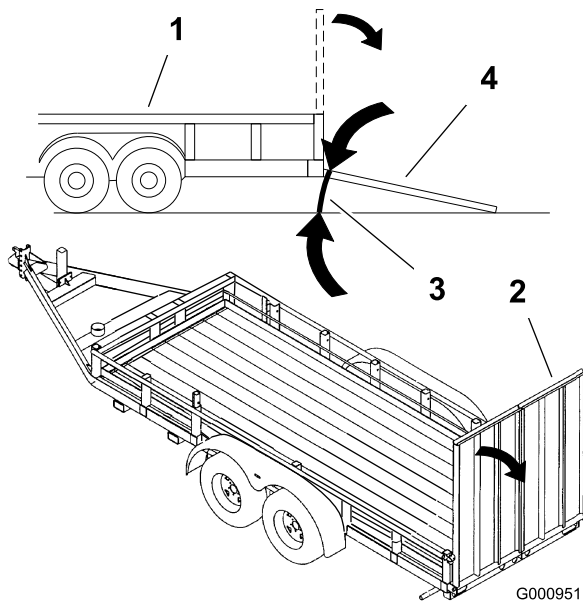


Figure 20

- |                    |                                |
|--------------------|--------------------------------|
| 1. Trailer         | 3. Not greater than 15 degrees |
| 2. Full width ramp | 4. Full width ramp—side view   |

## Transporting Machines

### ⚠ WARNING

Driving on the street or roadway without turn signals, lights, reflective markings, or a slow moving vehicle emblem is dangerous and can lead to accidents causing personal injury.

**Do not drive machine on a public street or roadway without signs, lights, and/or markings required by local regulations.**

Use a heavy-duty trailer or truck to transport the machine. Ensure that the trailer or truck has all necessary lighting and marking as required by law. Please carefully read all the safety instructions. Knowing this information could help you or bystanders avoid injury.

To transport the machine:

- Ensure that your vehicle, hitch, safety chains, and trailer are adequate for the load you are pulling and that they meet all local traffic regulations for your area.
- Lock the brake and block the wheels.
- Securely fasten the machine to the trailer or truck with straps, chains, cable, or ropes as required by local traffic regulations in your area (Figure 21).

## 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. A good rule to follow is: decrease ground speed as the load on the cutting blades increases; and increase ground speed as 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 have to slow down the forward speed and/or raise the height-of-cut to the next higher setting.

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

### Long Grass

If the grass is ever allowed 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.

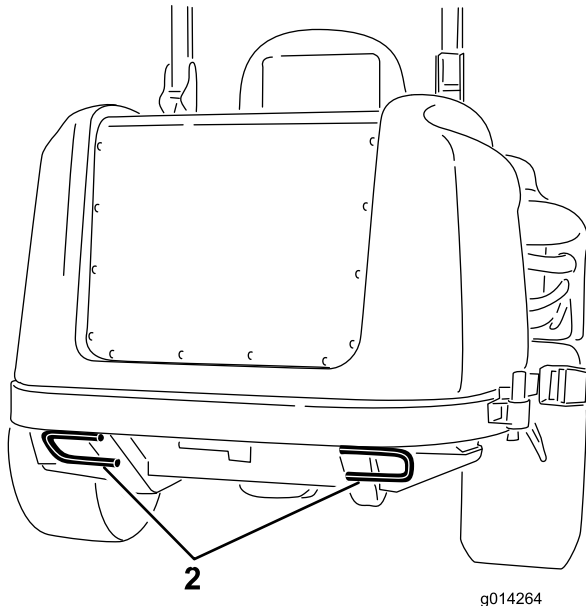
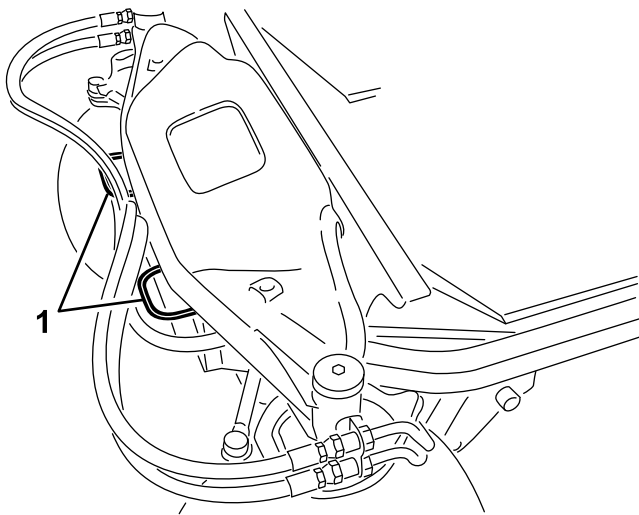


Figure 21

1. Front tie-down

2. Rear tie-downs



## 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 Servicing the Cutting Blades.

# 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"><li>• Check the alternator belt tension.</li><li>• Torque wheel lug nuts.</li></ul>
After the first 50 hours	<ul style="list-style-type: none"><li>• Change the engine oil and filter.</li></ul>
After the first 200 hours	<ul style="list-style-type: none"><li>• Change the hydraulic oil and filter.</li></ul>
Before each use or daily	<ul style="list-style-type: none"><li>• Test the safety system.</li><li>• Check the engine oil level.</li><li>• Check the engine coolant level.</li><li>• Clean the radiator with compressed air (do not use water)</li><li>• Check the hydraulic fluid level.</li></ul>
Every 50 hours	<ul style="list-style-type: none"><li>• Grease the bearing and bushing grease fittings.</li><li>• Check battery cable connections.</li><li>• Check the tire pressure.</li></ul>
Every 100 hours	<ul style="list-style-type: none"><li>• Check the alternator belt tension.</li></ul>
Every 150 hours	<ul style="list-style-type: none"><li>• Change the engine oil and filter.</li></ul>
Every 200 hours	<ul style="list-style-type: none"><li>• Inspect cooling system hoses and seals. Replace them if cracked or torn.</li><li>• Torque wheel lug nuts.</li></ul>
Every 400 hours	<ul style="list-style-type: none"><li>• 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.)</li><li>• Replace the fuel filter canister.</li><li>• Check the fuel lines and connections.</li></ul>
Every 800 hours	<ul style="list-style-type: none"><li>• Change the hydraulic oil and filter.</li><li>• Inspect engine valve clearance. Refer to your Engine Operator's Manual.</li></ul>
Every 1,500 hours	<ul style="list-style-type: none"><li>• Replace moving hoses</li></ul>
Every 2 years	<ul style="list-style-type: none"><li>• Drain and clean the fuel tank.</li><li>• Flush and replace cooling system fluid.</li></ul>

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

# Daily Maintenance Checklist

Duplicate this page for routine use.

Maintenance Check Item	For the week of:						
	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
Check Safety Interlock Operation							
Check Parking Brake Operation							
Check Fuel Level							
Check Hydraulic Oil Level							
Check Engine Oil Level							
Check Cooling System Fluid Level							
Check Drain Water/Fuel Separator							
Check Air Filter Restriction Indicator <sup>3</sup>							
Check Radiator & Screen for Debris							
Check Unusual Engine Noises <sup>1</sup>							
Check Unusual Operating Noises							
Check Hydraulic Hoses for Damage							
Check Fluid Leaks							
Check Tire Pressure							
Check Instrument Operation							
Lubricate All Grease Fittings <sup>2</sup>							
Touch-up Damaged Paint							

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

## QUICK REFERENCE AID



### CHECK/SERVICE (daily)

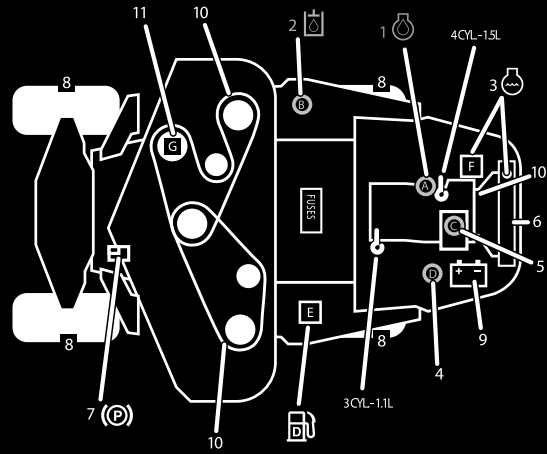
1. OIL LEVEL, ENGINE
2. OIL LEVEL, HYDRAULIC TANK
3. COOLANT LEVEL, RADIATOR
4. FUEL /WATER SEPARATOR
5. PRECLEANER - AIR CLEANER

6. RADIATOR SCREEN
7. BRAKE FUNCTION
8. TIRE PRESSURE
9. BATTERY
10. BELTS - DECK, FAN, ALTERNATOR
11. GEARBOX
- GREASING - SEE OPERATOR'S MANUAL

### 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	3.9 QTS. (3.7 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.

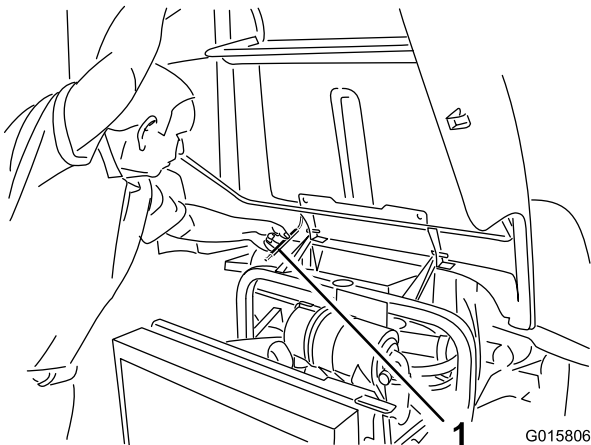


**Figure 22**  
Service Interval Chart

## Premaintenance Procedures

### Using the Hood Prop Rod

1. Release the hood latches.
2. Lift up on the hood until the prop rod can be positioned behind the frame tube (Figure 23).
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 the prop rod can be raised above the frame tube, then lower the hood.
5. Secure the hood latches



**Figure 23**

1. Prop rod

## Lubrication

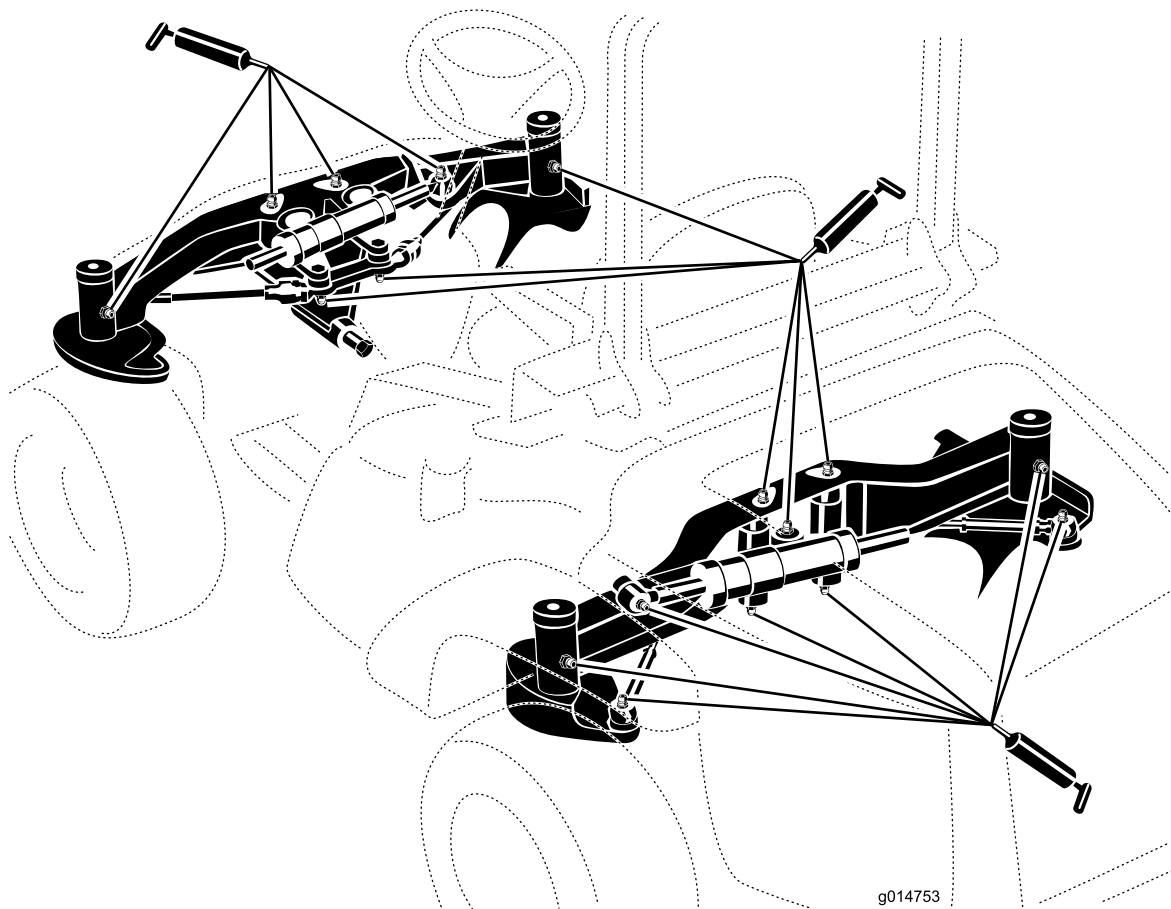
### Greasing the Bearings and Bushings

**Service Interval:** Every 50 hours

The machine has grease fittings that must be lubricated regularly with No. 2 General Purpose Lithium Base Grease. If the machine is operated under normal conditions, lubricate all bearings and bushings after every 50 hours of operation. Bearings and bushings must be lubricated daily when operating conditions are extremely dusty and dirty. Dusty and dirty operating conditions could cause dirt to get into the bearings and bushings, resulting in accelerated wear. Lubricate the grease fittings immediately after every washing, regardless of interval specified.

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

**Note:** To access the rear steering linkage grease fittings, the storage compartment needs to be removed.



**Figure 24**

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

# Engine Maintenance

## Servicing the Air Cleaner

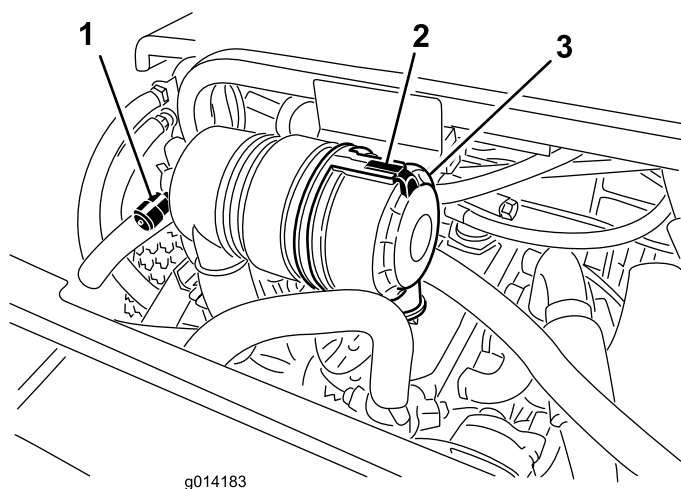
**Service Interval:** Every 400 hours

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

Service the air cleaner filter only when the service indicator (Figure 25) requires it. Changing the air filter before it is necessary only increases the chance of dirt entering the engine when the filter is removed.

**Important:** Be sure 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 25).



**Figure 25**

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

2. Remove the cover from the air cleaner body. Before removing the filter, use low pressure air (40 psi, clean and dry) 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.**

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

3. Remove and replace the filter.

Cleaning of the used element is not recommended due to the possibility of damage to 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. Remove the rubber outlet valve from the cover, clean the cavity and replace the outlet valve.
5. Install the cover orienting the rubber outlet valve in a downward position—between approximately 5:00 to 7:00 when viewed from the end.
6. 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, the oil level must be checked before and after the engine is first started.

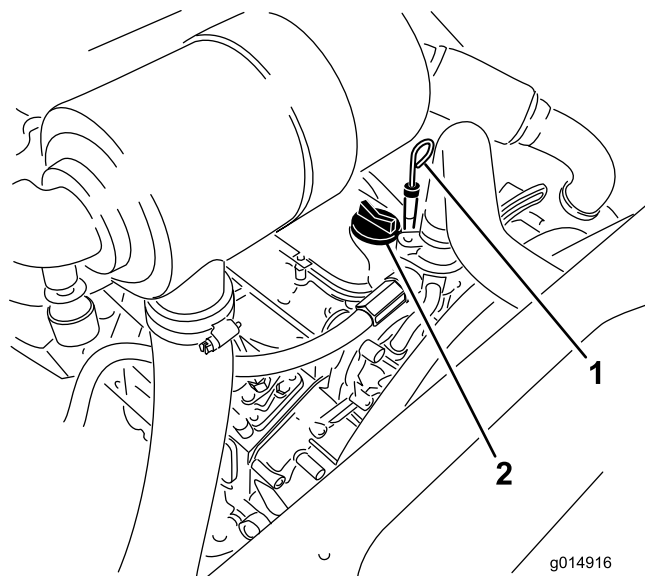
The crankcase capacity is approximately 5.2 liters (5.5 quarts) with the filter.

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 degrees 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. Park the machine on a level surface, stop the engine, set the parking brake and remove the key from the ignition switch.
2. Open the hood.
3. Remove the dipstick, wipe it clean, and install it (Figure 26).



**Figure 26**

- |             |                 |
|-------------|-----------------|
| 1. Dipstick | 2. Oil fill cap |
|-------------|-----------------|

4. Remove dipstick and check 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 26) 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.

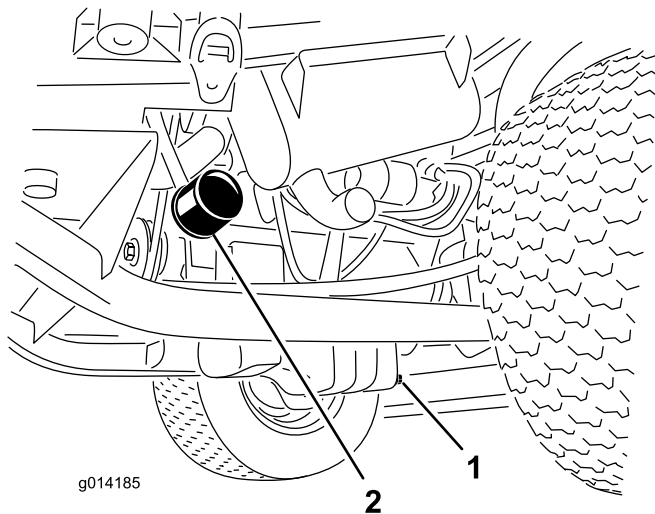
6. Install the oil fill cap and close the hood.

## Changing the Engine Oil and Filter

**Service Interval:** After the first 50 hours

Every 150 hours

1. Remove the drain plug (Figure 27) and let the oil flow into a drain pan.



**Figure 27**

- |                   |               |
|-------------------|---------------|
| 1. Oil drain plug | 2. Oil filter |
|-------------------|---------------|

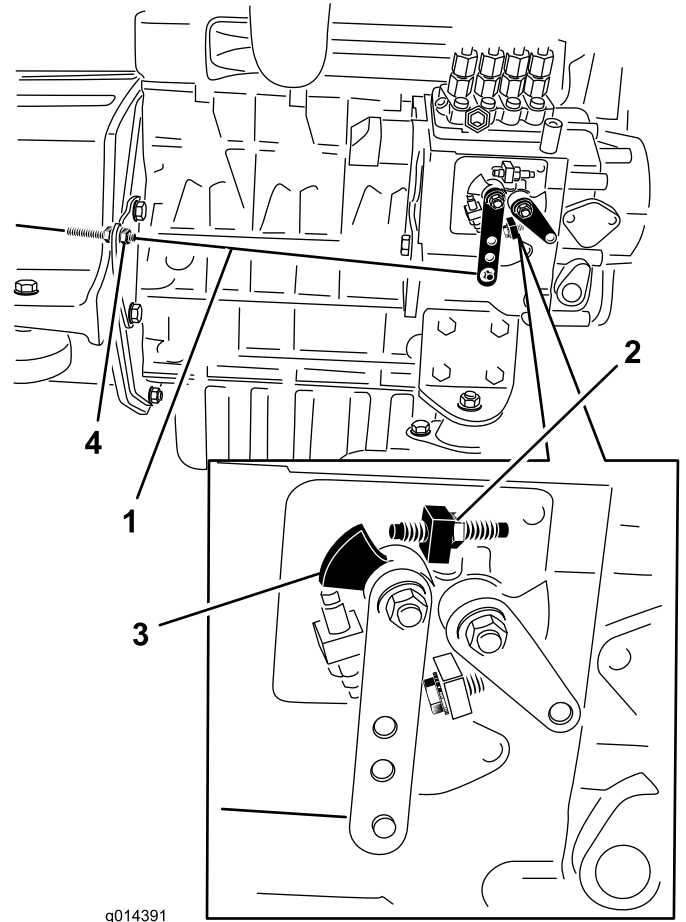
2. When the oil stops, install the drain plug.
3. Remove the oil filter (Figure 27).
4. Apply a light coat of clean oil to the new filter seal.
5. Install the replacement oil filter to the filter adapter. Turn the oil filter clockwise until the rubber gasket contacts the filter adapter, then tighten 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.

## Adjusting the Throttle

1. Move the throttle lever forward to the front of the control panel slot and then move it back approximately 1/8 inch into the FAST idle detent position.
2. Check the position of the speed control lever on the engine fuel injection pump. The speed control lever should be contacting the high speed screw when the throttle control lever is in the FAST (detent) position (Figure 28).



**Figure 28**

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

3. If necessary, the position of the throttle control cable jam nuts can be adjusted until speed control lever contacts high speed screw when throttle control lever is at FAST (detent) position (Figure 28).
4. Make sure that the cable jam nuts are fully tightened after the adjustment

# Fuel System Maintenance

**Note:** Refer to Adding Fuel for proper fuel recommendations.

## ⚠ DANGER

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

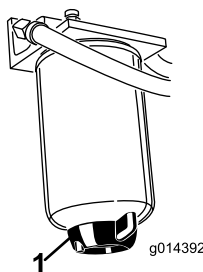
- Use a funnel and fill the fuel tank outdoors, in an open area, when the engine is off and is cold. Wipe up any fuel that spills.
- Do not fill the fuel tank completely full. Add fuel to the fuel tank until the level is to the bottom of the filler neck.
- Never smoke when handling fuel, and stay away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

## Servicing the Water Separator

**Service Interval:** Every 400 hours

Drain the water or other contaminants from the water separator (Figure 29) daily. Replace the filter canister after every 400 hours of operation.

1. Place a clean container under the fuel filter.
2. Loosen the drain plug on the bottom of the filter canister (Figure 29).



**Figure 29**

1. Water separator drain plug

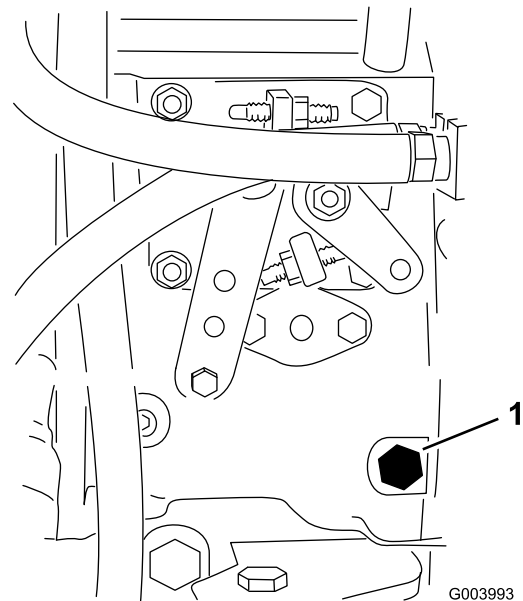
3. Clean the area where the filter canister mounts.
4. Remove the filter canister and clean the mounting surface.
5. Lubricate the gasket on the filter canister with clean oil.
6. Install the filter canister by hand until the gasket contacts mounting surface, then rotate it an additional 1/2 turn.

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 situations have occurred:

- Initial start up of a new machine.
  - 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. Park the machine on a level surface 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 30) with a 12 mm wrench.



**Figure 30**

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.

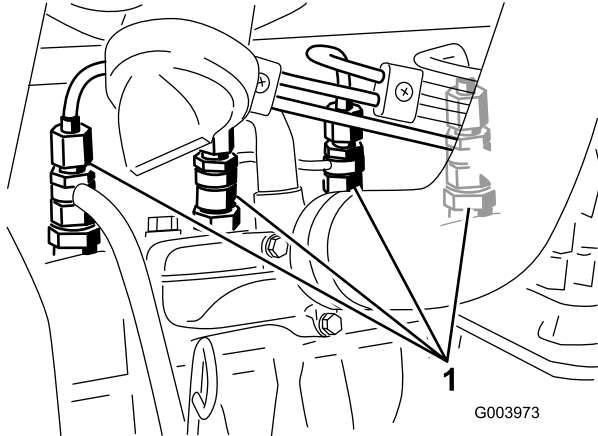
**Note:** Normally, the engine should start after the above bleeding procedures are followed. However, if engine does not start, air may be trapped between injection pump and injectors; refer to Bleeding Air from the Injectors.



# Bleeding Air from the Fuel Injectors

**Note:** This procedure should be used only if the fuel system has been purged of air through normal priming procedures and the engine will not start; refer to Bleeding the Fuel System.

1. Loosen the pipe connection to the No. 1 nozzle and holder assembly (Figure 31).



**Figure 31**

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 on the remaining nozzles.

## Cleaning the Fuel Tank

**Service Interval:** Every 2 years

Drain and clean 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 the machine is to be stored for an extended period.

## Fuel Lines and Connections

**Service Interval:** Every 400 hours

Check the fuel lines and connections every 400 hours or yearly, whichever comes first. Inspect them for deterioration, damage, chaffing, or loose connections.

# Electrical System Maintenance

**Important:** Whenever working with the electrical system, always disconnect the battery cables, negative (-) cable first, to prevent possible wiring damage from short-outs.

## Checking the Fuses

If the machine stops or has other electrical system issues, check the fuses. Grasp each fuse in turn and remove them one 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 one you are replacing, **otherwise you could damage the electrical system** (refer to the decal next to the fuses for a diagram of each fuse and its amperage).

The traction unit fuses are located under the seat (Figure 32).

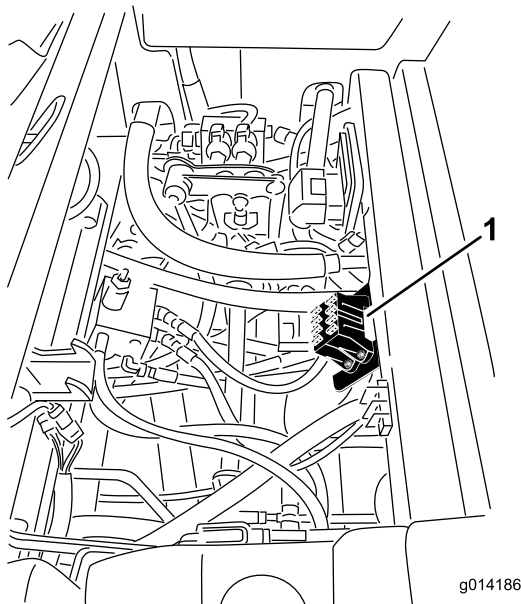


Figure 32

1. Fuse block location

The cab fuses are located in the fuse box on the cab headliner (Figure 33).

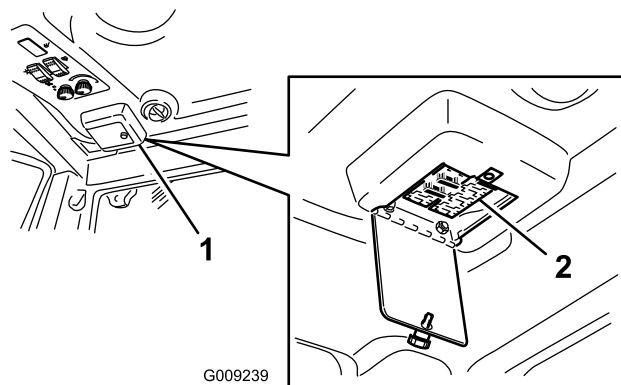


Figure 33

## 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.

### 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.

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

## **⚠ WARNING**

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

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

## **⚠ WARNING**

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

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

## **Storing the Battery**

If the machine will be stored 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 it is stored 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, make sure it is fully charged. The specific gravity of a fully charged battery is 1.265-1.299.

# **Drive System Maintenance**

## **Checking the Tire Pressure**

**Service Interval:** Every 50 hours

Check the pressure after every 50 operating hours or monthly, whichever occurs first.

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 uneven cut. Check the tires when they are cold to get the most accurate pressure reading.

# Cooling System Maintenance

## ⚠ DANGER

Discharge of hot pressurized coolant or touching 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 radiator and surrounding parts that are hot.

## ⚠ DANGER

The rotating fan and drive belt can cause personal injury.

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

## ⚠ CAUTION

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

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 liters (6 quarts).

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.

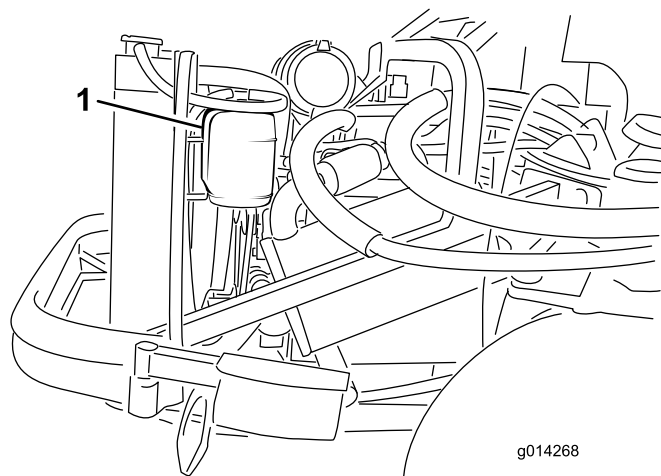


Figure 34

1. Expansion tank

## Cleaning the Radiator

**Service Interval:** Before each use or daily

To prevent the engine from overheating, the radiator must be kept clean. Normally, check the radiator daily and, if necessary, clean any debris off these parts. However, it will be necessary to check and clean the radiator frequently in extremely dusty and dirty conditions.

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

Clean the radiator as follows:

1. Open the hood and secure the prop rod.
2. Loosen the flange nut securing the clean out cover to the underside of the rear frame (Figure 35). Rotate the cover to the side to expose the clean out hole in the frame.

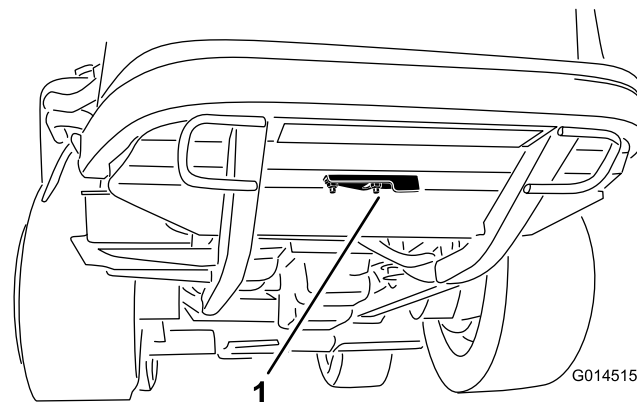


Figure 35

1. Clean out cover

3. Working from the fan side of the radiator, blow out debris with low pressure (50 psi) compressed air (**do not use water**). Repeat the step from the front of the radiator and again from the fan side.
4. After the radiator is thoroughly cleaned, clean out debris that may have collected in the channel at the radiator base and around the frame. Also, clean out the engine compartment and brake linkage to assure optimum performance.
5. Close the clean out cover and secure the flange nut.
6. Close the hood.

# 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 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 36).

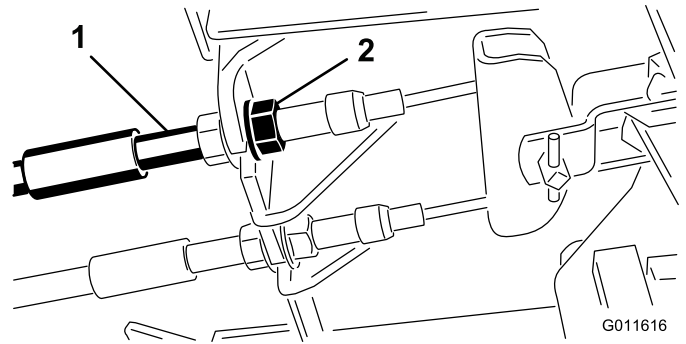


Figure 36

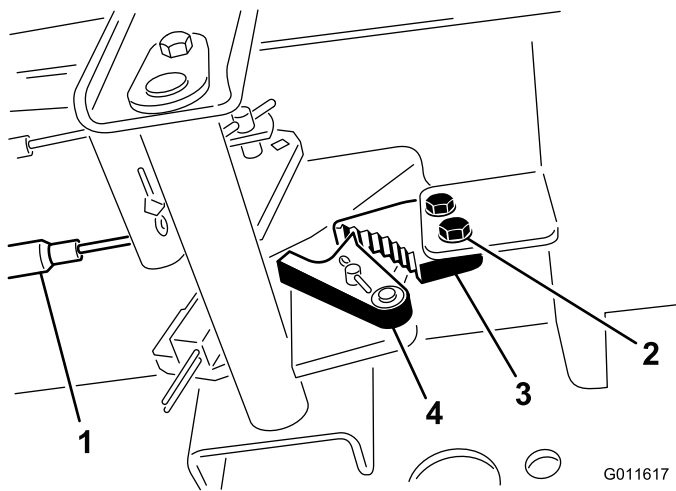
- |                 |               |
|-----------------|---------------|
| 1. Brake cables | 2. Front nuts |
|-----------------|---------------|

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 wheel lock up is achieved.
3. Tighten the front nuts, ensuring that both cables actuate the brakes simultaneously.

## Adjusting the Parking Brake

If the parking brake fails to engage, an adjustment to the brake pawl is required.

1. Loosen the 2 screws securing the parking brake pawl to the frame (Figure 37).



**Figure 37**

- |                 |                       |
|-----------------|-----------------------|
| 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 37).
3. Tighten the 2 screws locking the adjustment.
4. Press the brake pedal to release the parking brake.
5. Check the adjustment and readjust as required.

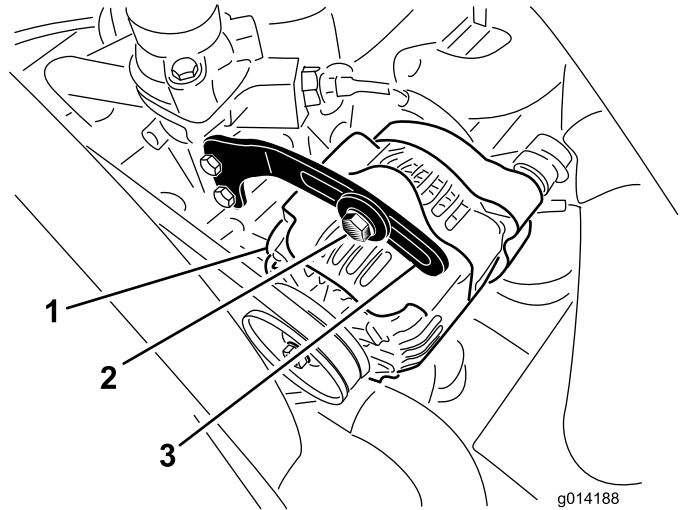
# Belt Maintenance

## 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 depressing it (Figure 38) midway between the alternator and the crankshaft pulleys with 10 kg (22 lb) of force.



**Figure 38**

- |               |          |
|---------------|----------|
| 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 correct, continue operation

3. Loosen the bolt securing the brace to the alternator (Figure 38), and the alternator pivot bolt.
4. Insert a pry bar between the alternator and the engine and pry out 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 oil changed or the traction motors or hoses replaced, any air trapped in the system will have to be worked out prior to performing this procedure. This can be accomplished by operating the machine in forward and reverse for a few minutes and then replenishing the oil as required.

When positioned on a level surface, the machine must not creep when the traction pedal is released. If it does creep, adjust as follows:

1. Park the machine on a level surface, stop the engine, and lower the cutting unit to the floor.
2. Jack up the rear of the machine until the rear tires are off the shop 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 shop floor and supported by jack stands.

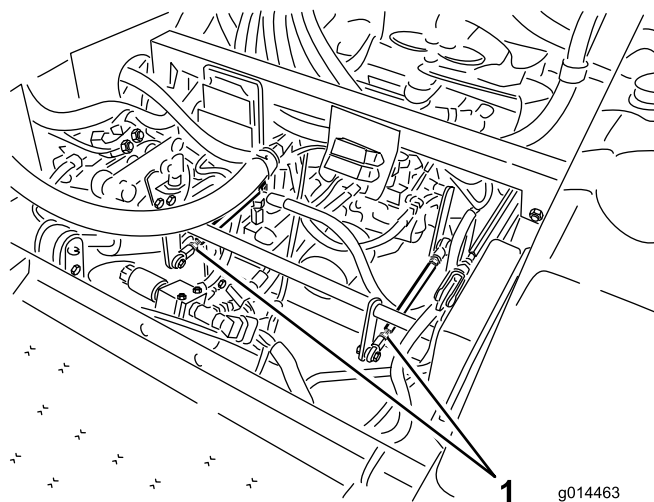
### **⚠ WARNING**

**The engine must be running so this adjustment can be performed. This could cause personal injury.**

**Keep hands, feet, face, and other body parts away from any hot parts of the engine and any rotating parts.**

3. Start the engine, set the throttle to the Slow position and observe which direction the rear tires rotate.
  - If the left rear tire is rotating, loosen the jam nuts on the left side transmission control rod (Figure 39).

**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.



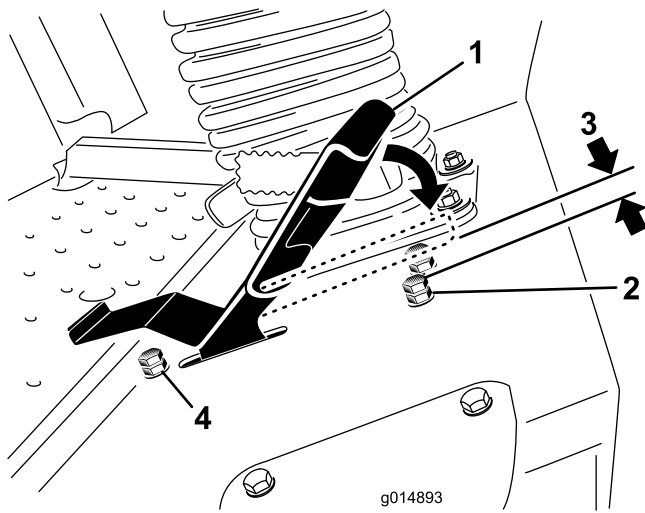
**Figure 39**

### 1. Transmission control rods

- If the left rear tire is rotating in reverse, lengthen the rod by slowly turning the rod counter-clockwise (as viewed from the front) until the left rear tire stops rotating or minimal rotation is detected 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. Make sure the wheel remains stopped or minimal creep is detected in reverse. Adjust as required.
  5. Tighten the jam nuts.
  6. Repeat the procedure for the right rear tire, if required, by using the right side transmission control rod.
  7. Stop the engine. Remove the jack stands and lower the machine to the shop floor.
  8. Test drive the machine to make sure it does not creep.

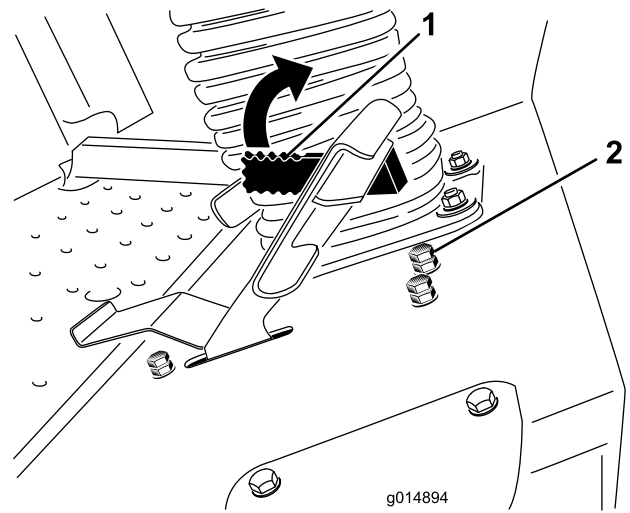
## Adjusting the Maximum Ground Speed

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 40).



**Figure 40**

- |                                   |                                   |
|-----------------------------------|-----------------------------------|
| 1. Traction pedal                 | 3. 0.060 inch (1.5 mm)            |
| 2. Stop bolt w/ jam nut (forward) | 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 only light pressure on the pedal when pushing it to the full forward position.
  6. With the seat in the raised position, verify that you are not over loading the linkage by making sure the transmission does not move when the pedal is depressed to the stop.
  7. Adjust the stop bolt out (towards 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.
  9. The reverse stop bolt may be adjusted if the maximum reverse speed is not acceptable. For a faster reverse speed, adjust the stop bolt in. For a slower reverse speed, adjust the stop bolt out.



**Figure 41**

- |                            |                         |
|----------------------------|-------------------------|
| 1. Mow speed limiter lever | 2. Stop bolt w/ jam nut |
|----------------------------|-------------------------|
- 

4. Thread the stop bolt in to increase the mow speed and out to decrease the mow speed.
5. Tighten the jam nut to lock the adjustment.
6. Rotate the mow speed limiter lever down, operate the machine to verify the adjustment and readjust the stop bolt as required.

## Adjusting the Mow Speed Limiter Lever

The mow speed limiter lever (Figure 41) can be flipped forward to limit the traction speed while operating.

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 mow speed limiter stop bolt (Figure 41).



# Hydraulic System Maintenance

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

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

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

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

**Note:** Many hydraulic fluids are almost colorless, making it difficult to spot leaks. A red dye additive for the hydraulic system oil is available in 2/3 oz. (20 ml) bottles. One bottle is sufficient for 4-6 gal (15-22 l) of hydraulic oil. Order part number 44-2500 from your authorized Toro distributor.

## Checking the Hydraulic System

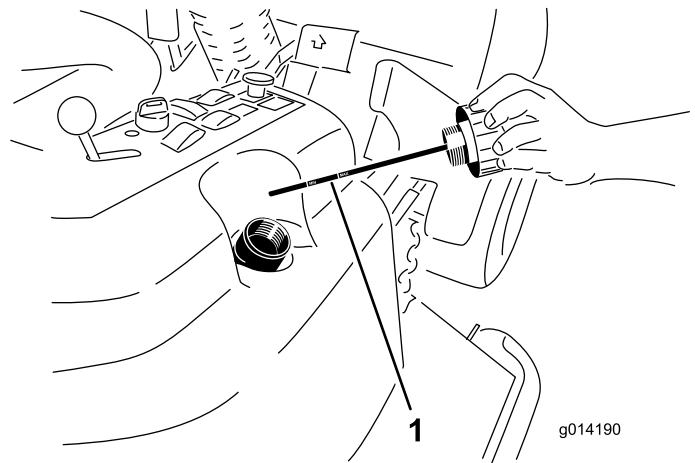
**Service Interval:** Before each use or daily

Check the level of the hydraulic fluid before the engine is first started and daily thereafter.

1. Position the machine on a level surface. Release the traction pedal to the neutral position and start the engine. Run engine at lowest possible RPM to purge the system of air. **Do not engage the PTO.** Raise the deck to extend lift cylinders, stop the engine, and remove the key.
2. Remove the hydraulic fill cap (Figure 42) from filler neck.
3. Remove the dipstick and wipe it with a clean rag (Figure 42).
4. Screw the dipstick all the way into the filler neck; then remove it and check level of fluid (Figure 42).

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.**

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



**Figure 42**

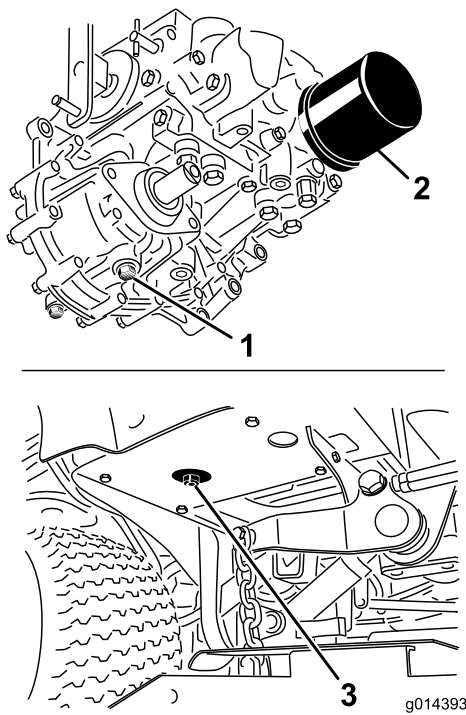
1. Dipstick

## Changing the Hydraulic Oil 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, draining all of the hydraulic fluid (Figure 43).



**Figure 43**

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

4. Clean the area around the hydraulic oil filter and remove it (Figure 43).
5. Immediately install a new hydraulic oil filter.
6. Install the hydraulic reservoir and transmission case drain plugs.
7. Fill the reservoir to the proper level (approximately 18 quarts [17 l]); refer to Checking the Hydraulic Fluid.
8. Start the engine and check for oil leaks. Allow the engine to run for about five minutes, then shut it off.
9. After two minutes, check the level of the hydraulic fluid; refer to Checking the Hydraulic Fluid.

# Storage

## Engine

1. Drain the engine oil from the oil pan and replace the drain plug.
2. Remove and discard the oil filter. Install a new filter.
3. Refill the engine with 4 quarts (3.8 l) of recommended motor oil. Refer to Changing the Engine Oil.
4. Start the engine and run it at idle speed for two minutes.
5. Drain the fuel from the fuel tank, fuel lines, pump, filter, and separator. Flush the fuel tank with clean diesel fuel and connect all fuel lines.
6. Thoroughly clean and service the air cleaner assembly.
7. Seal the air cleaner inlet and the exhaust outlet with weather proof masking tape.
8. Check the oil filler cap and fuel tank cap to ensure they are securely in place.

## Machine

1. Thoroughly clean the machine, deck and the engine, paying special attention to these areas:
  - Radiator and radiator screen
  - Counterbalance springs
  - PTO shaft assembly
  - All grease fittings and pivot points
  - Remove the control panel and clean out inside of the control box
  - Beneath the seat plate and top of the transmission
2. Check and adjust front and rear tire pressure; refer to Checking Tire Pressure.
3. Check all fasteners for looseness and tighten them as necessary.
4. Grease or oil all grease fittings, pivot points, and transmission by-pass 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 recharge the battery for 24 hours every 60 days to prevent lead sulfation of the battery.

**Notes:**



# The Toro Total Coverage Guarantee

## A Limited Warranty

### Conditions and Products Covered

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

\* Product equipped with an hour meter.

### Instructions for Obtaining Warranty Service

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

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

### Owner Responsibilities

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

### Items and Conditions Not Covered

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

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

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

### Parts

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

### Deep Cycle and Lithium-Ion Battery Warranty:

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

### Maintenance is at Owner's Expense

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

### General Conditions

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

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

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

### Note regarding engine warranty:

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

### Countries Other than the United States or Canada

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