Form No. 3403-609 Rev A

TORO®

Count on it.

Operator's Manual

Groundsmaster® 5900 or 5910 Rotary Mower

Model No. 31598—Serial No. 316000001 and Up
Model No. 31598N—Serial No. 316000001 and Up
Model No. 31599—Serial No. 316000001 and Up
Model No. 31599N—Serial No. 316000001 and Up

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

3403-609 A

⚠ WARNING

CALIFORNIA
Proposition 65 Warning

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

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

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

The enclosed *Engine Owner's Manual* is supplied for information regarding the US Environmental Protection Agency (EPA) and the California Emission Control Regulation of emission systems, maintenance, and warranty. Replacements may be ordered through the engine manufacturer.

Introduction

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

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

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

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

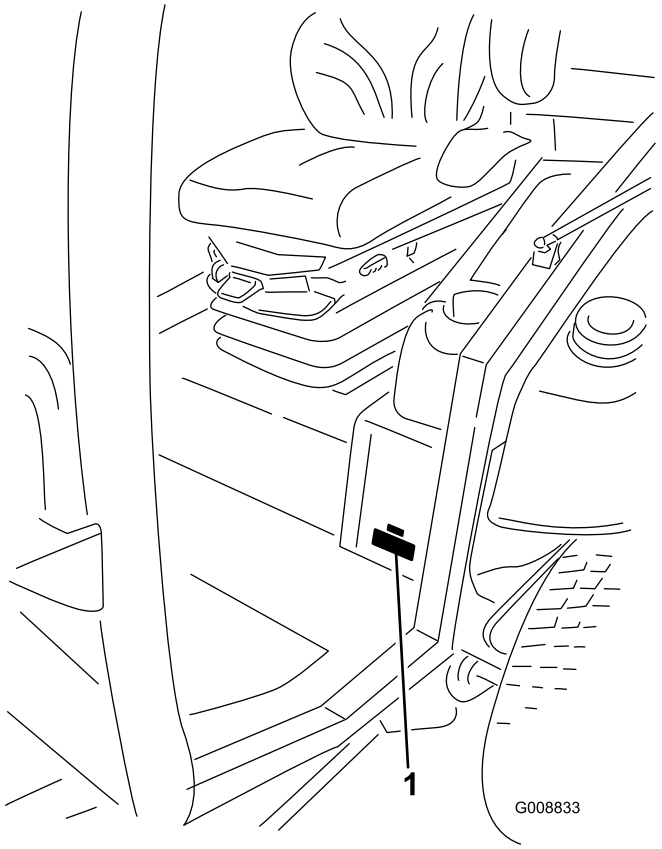


Figure 1

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

8111 Lyndale Avenue South
Bloomington, MN 55420

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

Contents

Safety

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

General Safety

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

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

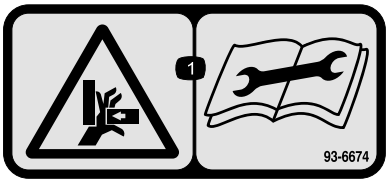
- Read and understand the contents of this *Operator's Manual* before you start the engine. Ensure that everyone using this product knows how to use it and understands the warnings.
- Do not put your hands or feet near moving components of the machine.
- Do not operate the machine without all guards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

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

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

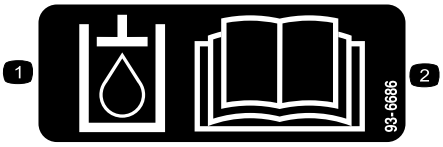
Safety and Instructional Decals

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



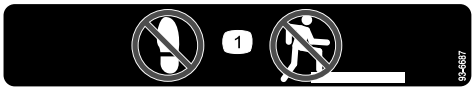
93-6674

1. Crushing hazard, hand—read the instructions before servicing or performing maintenance.



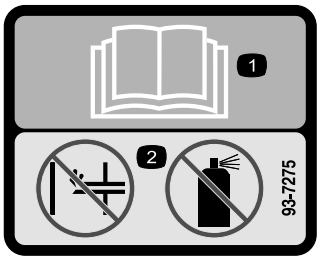
93-6686

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



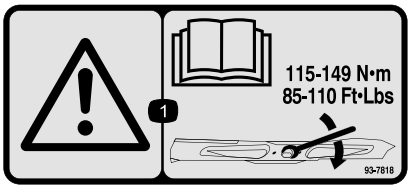
93-6687

1. Do not step here.



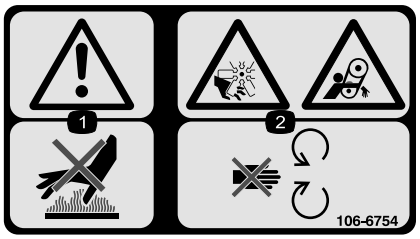
93-7275

1. Read the *Operator's Manual*—do not use starting fluid to start the engine.



93-7818

1. Warning—read the *Operator's Manual* for instructions on torquing the blade bolt/nut to 115 to 149 N·m (85 to 110 ft-lb).

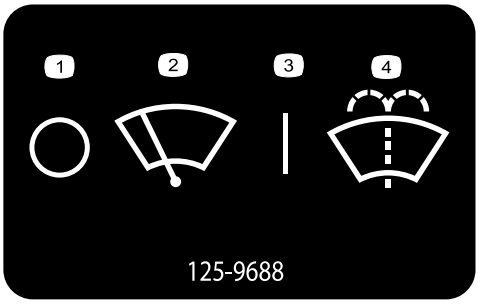


106-6754

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

106-6755

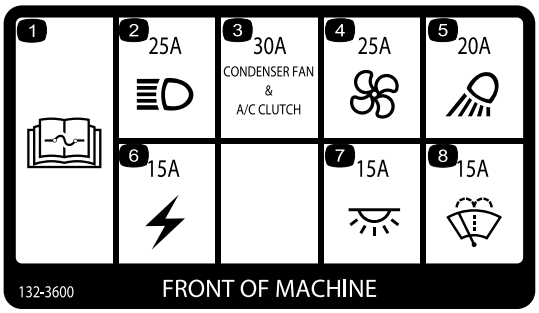
1. Engine coolant under pressure.
2. Explosion hazard—read the *Operator's Manual.*
3. Warning—do not touch the hot surface.
4. Warning—read the *Operator's Manual.*



125-9688

Model with Cab Only

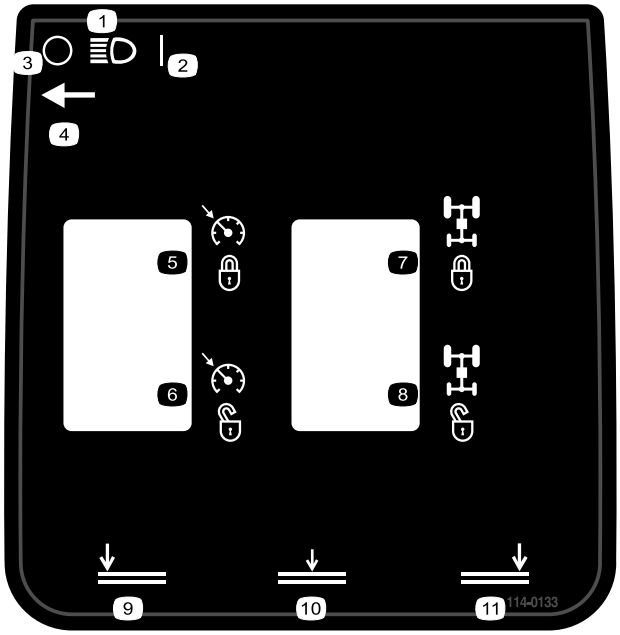
1. Windshield wipers—off
2. Windshield wipers
3. Windshield wipers—on
4. Spray windshield washer fluid



132-3600

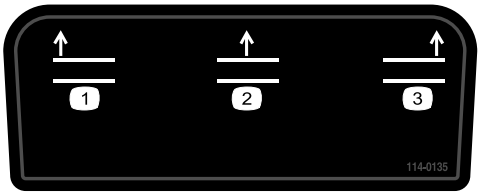
Model with Cab Only

1. Read the *Operator's Manual* for more information on fuses.
2. Headlight—25 A
3. Condenser fan and A/C clutch—30 A
4. Fan—25 A
5. Working light—20 A
6. Auxiliary power—15 A
7. Cab light—15 A
8. Windshield wipers—15 A



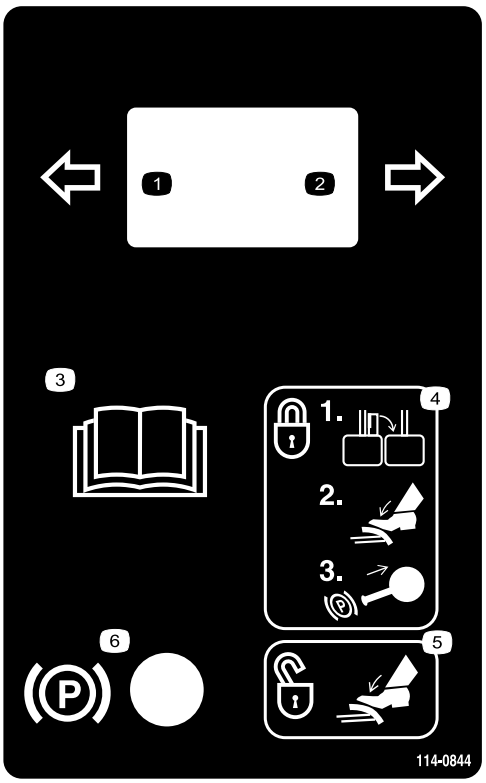
114-0133

1. Headlights
2. On
3. Off
4. Headlight switch location
5. Cruise control—engage
6. Cruise control—disengage
7. Traction assist—engage
8. Traction assist—disengage
9. Lower cutting units—left
10. Lower cutting units—center
11. Lower cutting units—right



114-0135

1. Raise cutting units—left
2. Raise cutting units—center
3. Raise cutting units—right

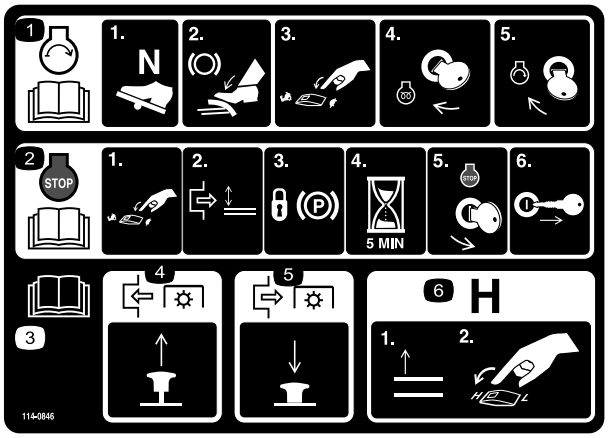


114-0844

1. Left turn signal
2. Right turn signal
3. Read the *Operators Manual.*
4. To lock the brakes, close the latch, press the brake pedal, and pull up on the parking-brake knob.
5. To unlock the parking brake, press the brake.
6. Parking brake

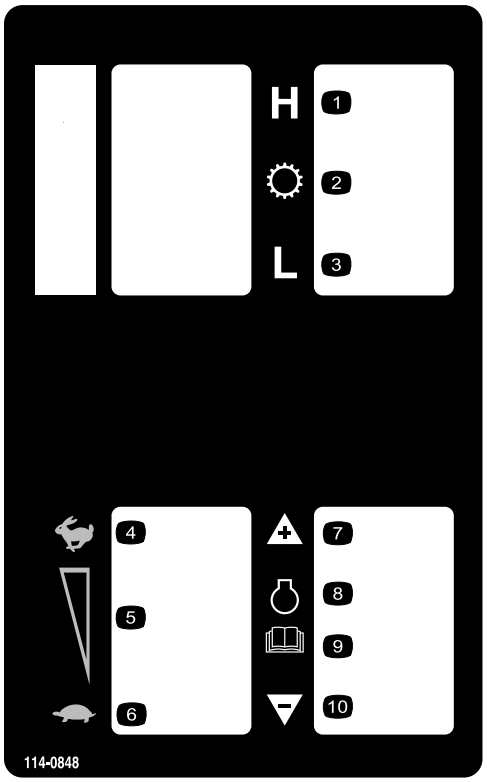
114-0845

1. Tilt steering lever
2. Horn



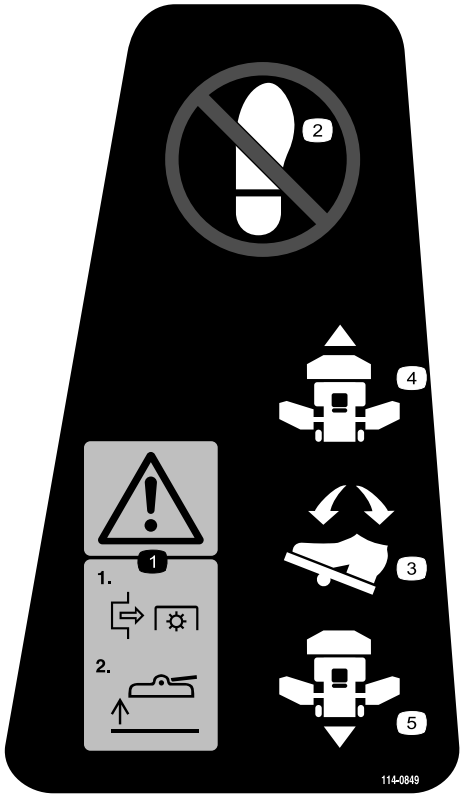
114-0846

1. Read the *Operators Manual*; to start the engine, move the traction pedal to Neutral, apply the brake, move the throttle switch to low, turn the ignition key to Preheat. When the Wait to Start Advisory clears on the Info Center, turn the ignition key to Start.
2. Read the *Operators Manual*; to stop the engine, move the throttle lever to slow, disengage the PTO, set the parking brake, wait 5 minutes, turn the ignition key to Stop, and remove the key; read the *Operators Manual.*
3. Read the *Operators Manual.*
4. To engage the PTO, pull up on the PTO switch.
5. To disengage the PTO, push down on the PTO switch.
6. To switch the transmission to high speed, fully raise the attachments and switch the speed control to High.



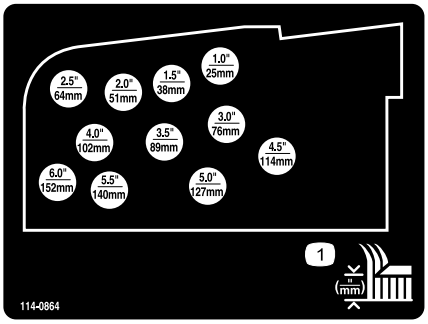
114-0848

1. High range
2. Transmission
3. Low range
4. High idle
5. Mid idle
6. Low idle
7. Increase engine speed
8. Engine
9. Read the *Operator's Manual.*
10. Decrease engine speed



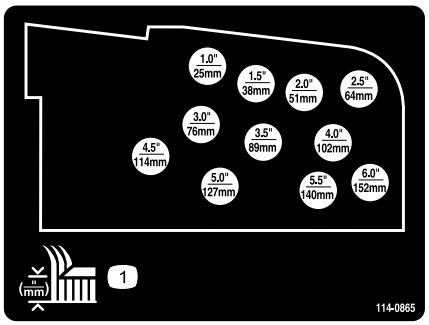
114-0849

1. Warning—disengage the PTO then raise the deck.
2. No step
3. Traction control pedal
4. Forward
5. Reverse



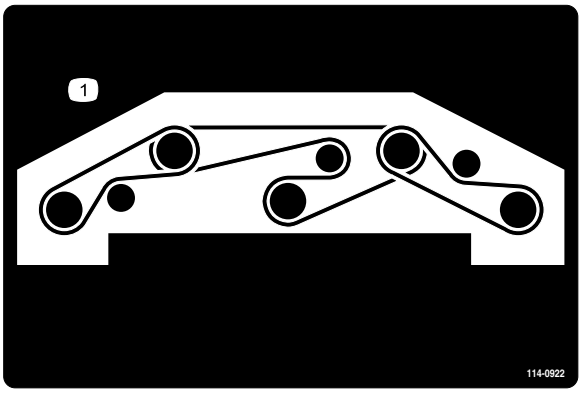
114-0864

1. Height-of-cut adjustment



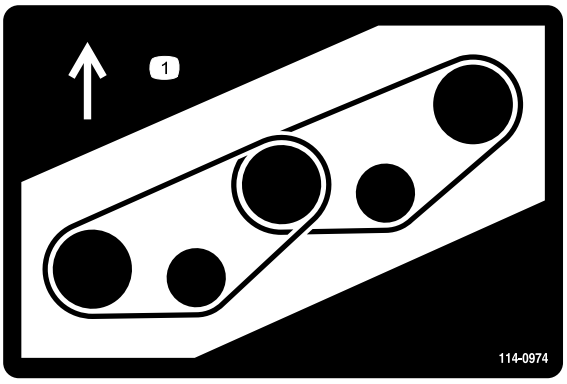
114-0865

1. Height-of-cut adjustment



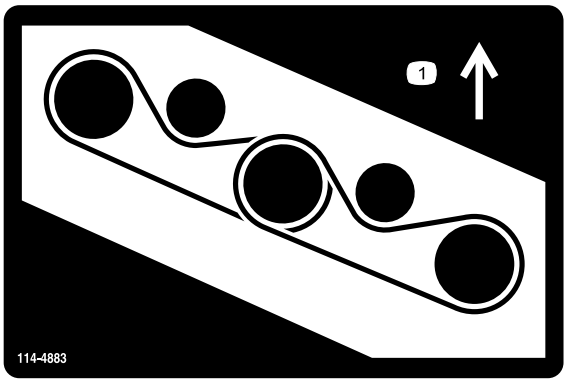
114-0922

1. Belt routing



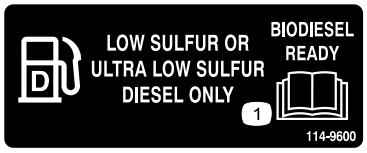
114-0974

1. Belt routing



114-4883

1. Belt routing

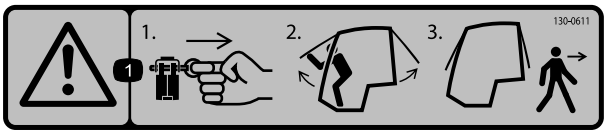


114-9600

1. Read the *Operator's Manual.*

115-5459

1. Electric shock hazard—do not remove cover; keep cover in place.



130-0611

Model with Cab Only

1. Warning—1) Remove the pin; 2) Raise the doors; 3) Exit the cab

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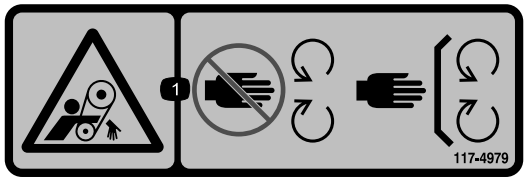
CALIFORNIA SPARK ARRESTER WARNING

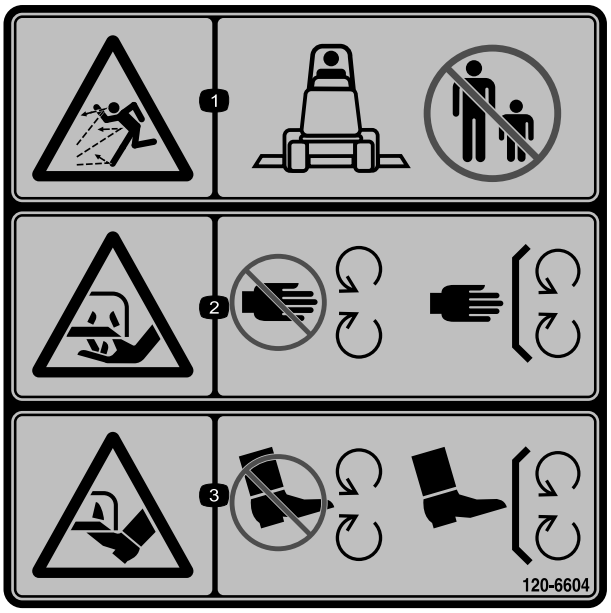
Operation of this equipment may create sparks that can start fires around dry vegetation. A spark arrester may be required. The operator should contact local fire agencies for laws or regulations relating to fire prevention requirements. 117-2718

117-2718



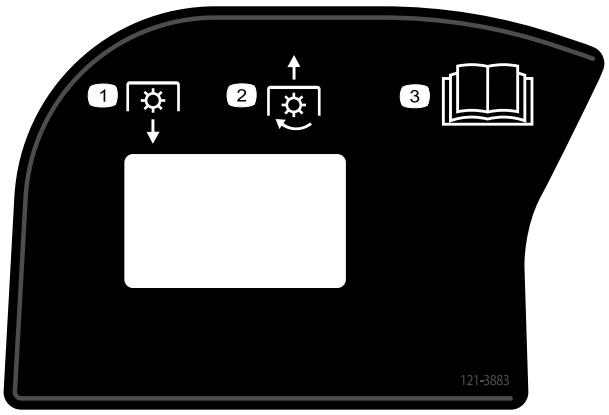
117-4979

1. Entanglement hazard, belt—stay away from moving parts, keep all guards and shields in place.



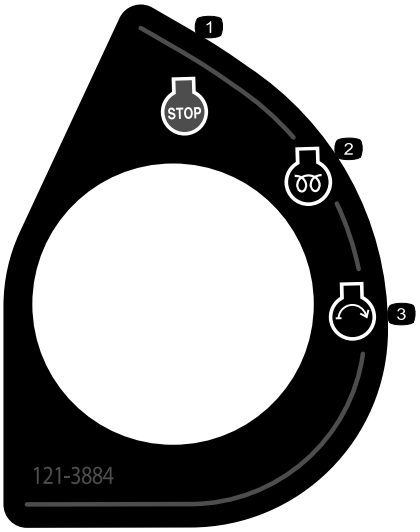
120-6604

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.



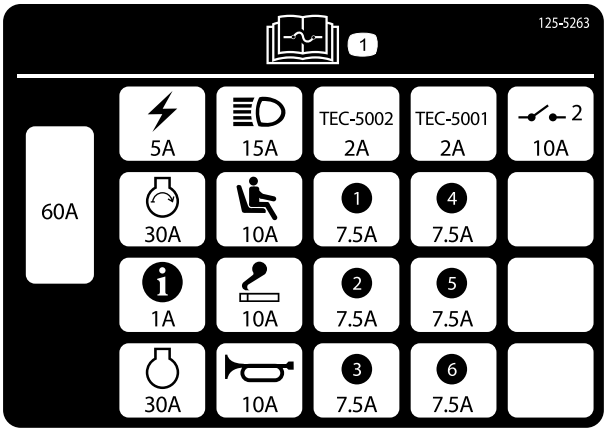
121-3883

1. Disengage the PTO
2. Engage the PTO
3. Read the *Operator's Manual*



121-3884

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



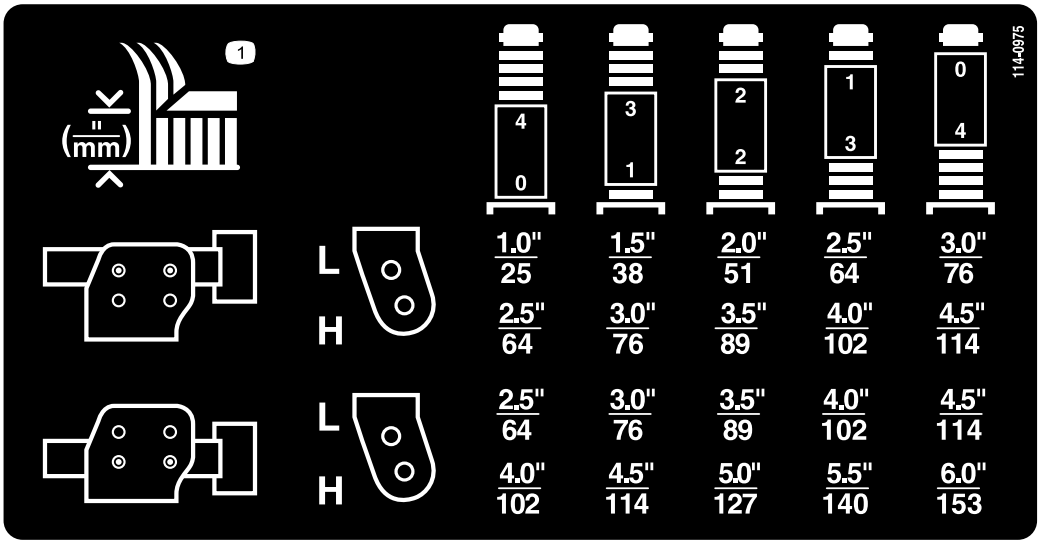
125-5263

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

Battery Symbols

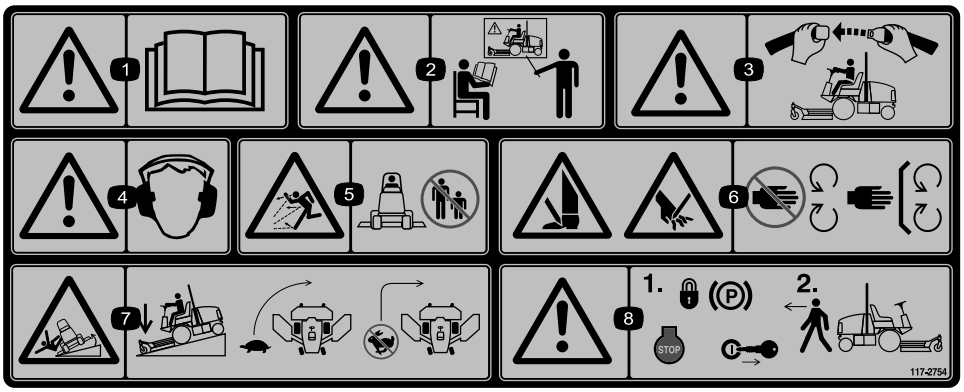
Some or all of these symbols are on your battery

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



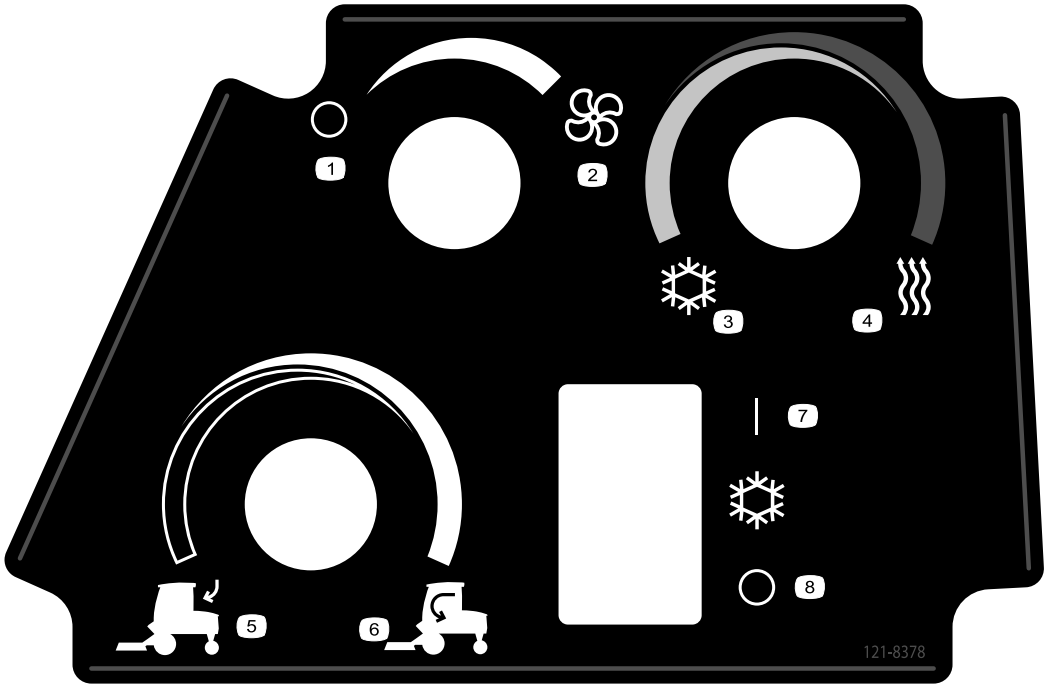
114-0975

1. Height of cut



117-2754

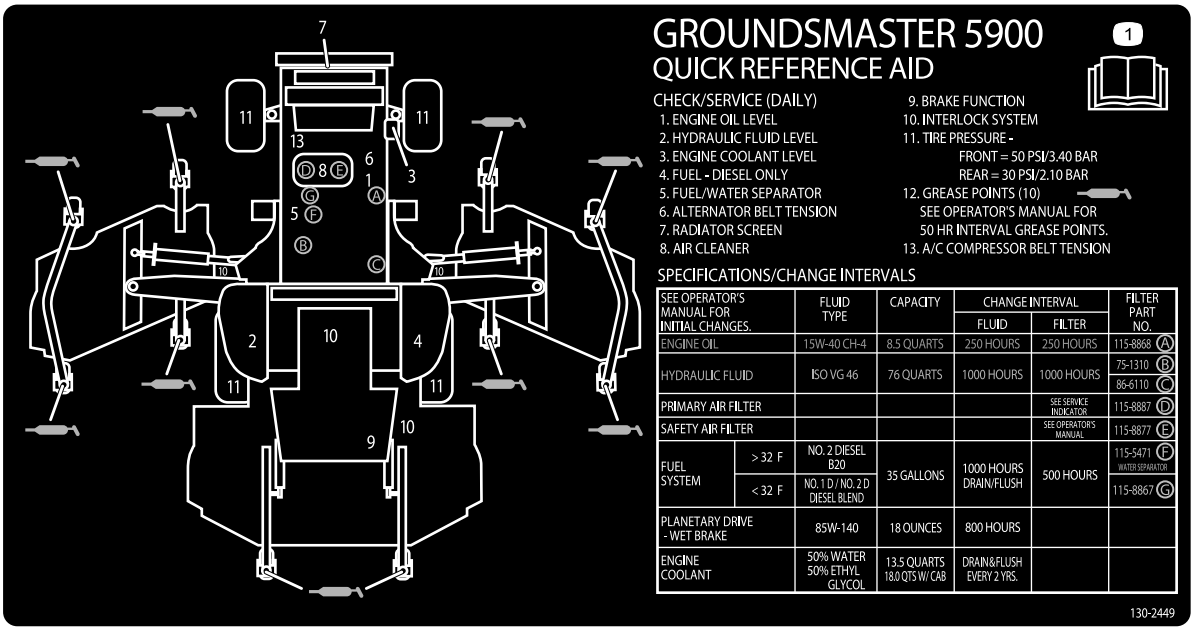
1. Warning—read the *Operator's Manual.*
2. Warning—do not operate this machine unless you are trained.
3. Warning—wear the seat belt when seated in the operator's position.
4. Warning—wear hearing protection.
5. Thrown object hazard—keep bystanders a safe distance from the machine.
6. Cutting hazard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



121-8378

Model with Cab Only

1. Fan—off
2. Fan—on full
3. Cold air
4. Hot air
5. External air
6. Internal air
7. Air conditioner—off
8. Air conditioner—on



130-2449

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

Setup

Loose Parts

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

Procedure	Description	Qty.	Use
1	No parts required	–	Remove the side-deck shipping straps and brace.
2	Right deck cover Left deck cover V-Belt	1 1 2	Lower the front deck winglets.
3	No parts required	–	Level the front, center deck.
4	No parts required	–	Level the winglet decks to the front, center deck.
5	No parts required	–	Prepare the machine.

Media and Additional Parts

Description	Qty.	Use
Operator's Manual	1	Review it before operating the machine.
Engine Owner's Manual	1	Use it to reference engine information.
Parts Catalog	1	Use it to reference part numbers and order replacement parts.
Operator training materials	1	Read the materials before operating the machine.
Declaration of conformity	1	For CE compliance

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

Note: Some parts may have already been installed at the factory.

1

Removing the Side-Deck Shipping Strap and Brace

No Parts Required

Procedure

Remove the strap and brace securing the side decks for shipping.

2

Lowering the Front-Deck Winglets

Parts needed for this procedure:

1	Right deck cover
1	Left deck cover
2	V-Belt

Procedure

1. Remove the nuts securing the front and rear stop bolts to the right winglet-deck mounts (Figure 3).

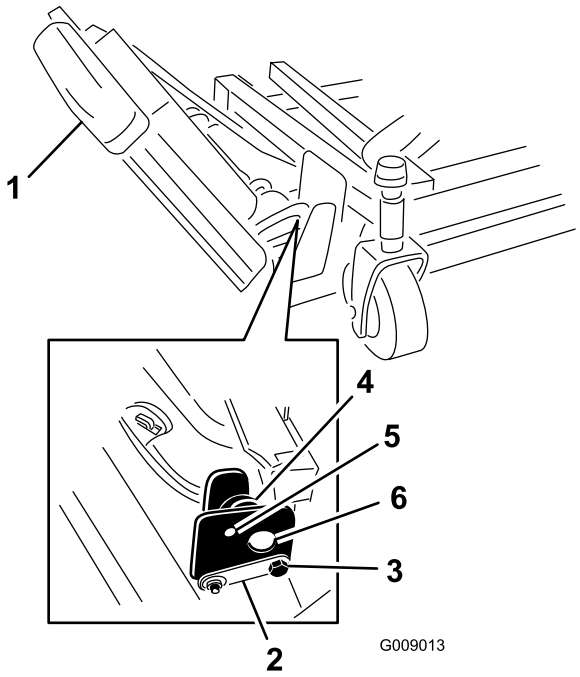


Figure 3

1. Winglet
2. Hinge pin
3. Stop bolt
4. Eccentric
5. Upper hole
6. Deck mounts

2. While supporting the right winglet, remove the front and rear stop bolts from the deck mounts (Figure 3).

   Note: Leave the eccentrics positioned between the deck mounts.

3. Lower the winglet to the operating position.
4. Install the front and rear stop bolts through the upper-mounting holes and eccentrics (Figure 4).

   Note: Ensure that the stop bolt engages the tab on the hinge pin.

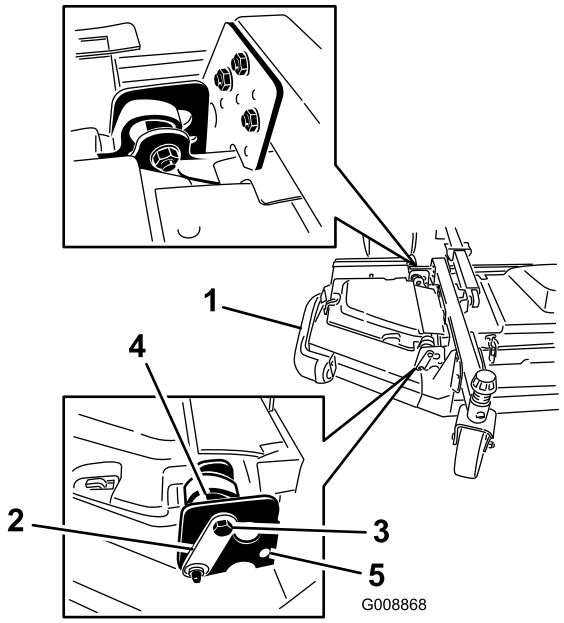


Figure 4

1. Winglet
2. Hinge pin
3. Bolt
4. Eccentric
5. Lower hole

5. Install the nuts securing the stop bolts.

   Note: Do not tighten the nuts at this time.

6. Repeat this procedure on left winglet.
7. Install the winglet belts as follows:

   A. Start the belt around the winglet-spindle pulley and the front-deck-spindle pulley (Figure 5).

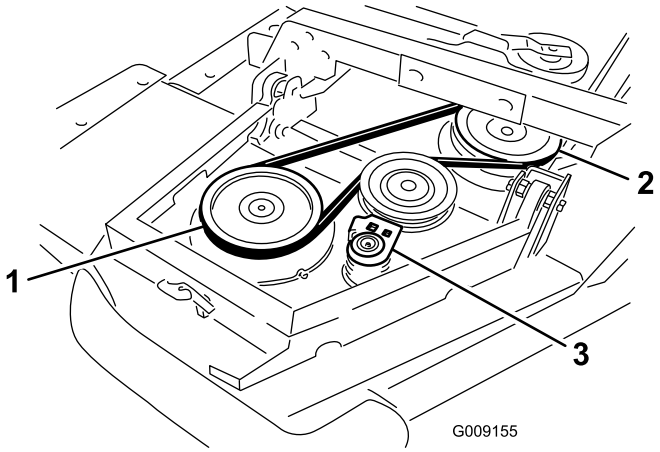


Figure 5

1. Winglet-spindle pulley
2. Front-deck-spindle pulley
3. Idler pulley

   B. Using a ratchet wrench or a similar tool, move the idler pulley away from the pulleys (Figure 5).

   C. Route the belt around the winglet-spindle pulley and the upper-spindle pulley on the front deck.

   D. Release the idler pulley to put tension on the belt.

8. Install the winglet-deck cover and secure it with the rubber latch (Figure 6).

   Note: Ensure that you slide the cover under the front, center deck-cover tabs before inserting it onto the mounting hooks and post.

9. Repeat this procedure on the other winglet.

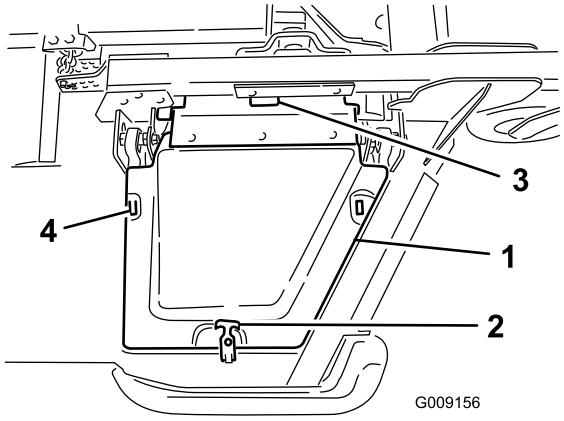


Figure 6

1. Cover
2. Rubber latch
3. Front, center deck-cover tabs
4. Mount hooks

3

Leveling the Front, Center Deck

No Parts Required

Procedure

Refer to Adjusting the Height of Cut (page 26).

1. Rotate the blade on each outer spindle until the ends face forward and backward.
2. Measure from the floor to the front tip of the blade.
3. Adjust the 1/8 inch shims on the front caster fork(s) to match the desired height of cut.
4. Rotate the blades 180° and measure from the floor to the rear-facing tip of the blade.
5. Loosen the lower jam nuts on the height-of-cut chain U-bolt.
6. Adjust the nuts to raise or lower the rear of the mower deck so that the tips of the front and rear blades have the same measurement.
7. Tighten the jam nuts.

4

Leveling the Winglet Decks to the Front, Center Deck

No Parts Required

Procedure

1. Rotate the blade on each winglet so that it points side to side.
2. Loosen the bolts and nuts securing the 2 eccentric spacers to the winglets (Figure 7).

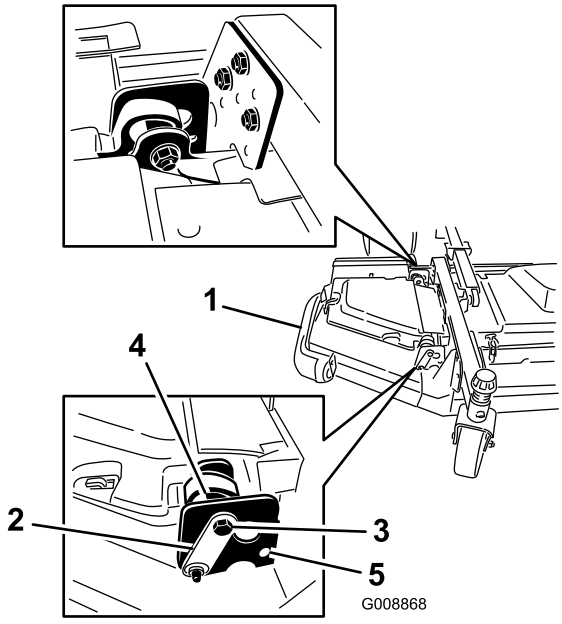


Figure 7

1. Winglet
2. Hinge pin
3. Stop bolt
4. Eccentric
5. Upper hole

3. Rotate the rear (closest to the traction unit) eccentric until the outside blade tip is about 3 mm (1/8 inch) higher than the desired height of cut (Figure 7).

   Note: There is a notch on the eccentric hex, which is 180° from the lobe on the eccentric cam (Figure 8). Use the notches to reference the location of the lobes when adjusting the eccentrics.

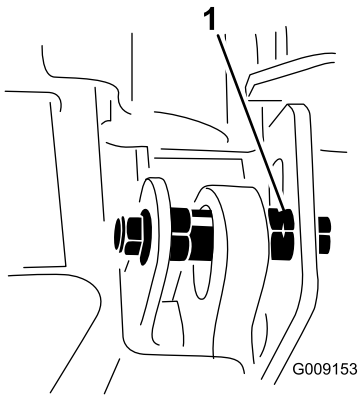


Figure 8

1. Eccentric notch

4. Tighten the bolt and nut for this eccentric to 149 N·m (110 ft-lb).
5. Adjust the forward eccentric until it just makes contact with the inner slot surface of the winglet-pivot brackets.
6. Tighten the bolt and nut for this eccentric to 149 N·m (110 ft-lb).
7. Repeat the procedure on the opposite winglet.

5

Preparing the Machine

No Parts Required

Checking the Tire Pressure

Check the tire pressure before use; refer to Checking the Tire Pressure (page 25).

Important: Maintain pressure in all tires to ensure a good quality-of-cut and proper machine performance. *Do not underinflate the tires.*

Checking the Fluid Levels

1. Check the engine-oil level before starting the engine; refer to Checking the Engine-Oil Level (page 43).
2. Check the hydraulic-fluid level before starting the engine; refer to Checking the Hydraulic Fluid (page 55).
3. Check the cooling system before starting the engine; refer to Checking the Cooling System (page 51).

Greasing the Machine

Grease the machine before use; refer to Lubrication (page 39). Failure to properly grease the machine results in premature failure of critical parts.

Product Overview

Controls

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

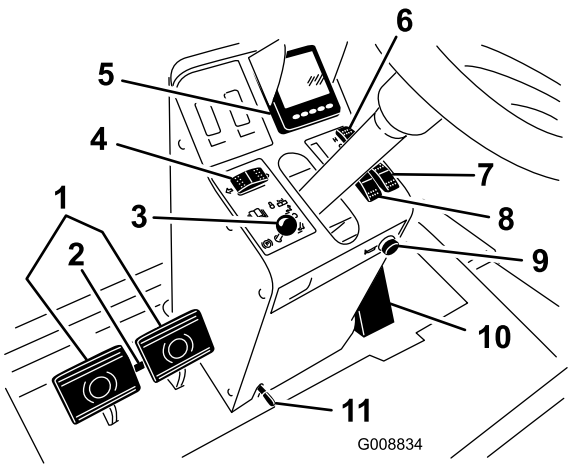


Figure 9

1. Brake pedals
2. Pedal-locking latch
3. Parking-brake latch
4. Turn-signal switch
5. Info center
6. High-Low range-speed switch
7. Variable throttle switch
8. Throttle switch
9. Horn
10. Traction pedal
11. Steering-lever tilt

Traction Pedal

The traction pedal controls the forward and reverse operation. Press the top of the pedal to move the machine forward and the bottom to move it backward. 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 HIGH IDLE position (Figure 9).

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

Pedal-Locking Latch

The pedal-locking latch connects the pedals together to engage the parking brake (Figure 9).

Parking-Brake Latch

The knob on the left side of the console actuates the parking-brake lock . To engage the parking brake, connect the pedals with the pedal-locking latch, push down on both pedals, and pull the parking-brake latch out. To release the parking brake, press both pedals until the parking-brake latch retracts (Figure 9).

Steering-Lever Tilt

Press the lever down to tilt the steering wheel to the desired position. Release the lever to lock the adjustment (Figure 9).

Turn-Signal Switch

Press the left side of the turn-signal switch to activate the left-turn signal and the right side of the switch to activate the right-turn signal (Figure 9).

Note: The center position is off.

High-Low Range Speed Switch

Press the front of the switch to select HIGH-SPEED RANGE. Press the rear of the switch to select LOW-SPEED RANGE. The machine must be stationary or traveling at a very slow speed, less than 3.2 km/h (2 mph), to shift to HIGH–LOW (Figure 9).

Horn Button

Press the horn button to activate the horn (Figure 9).

Throttle Switch

The throttle switch has 3 positions LOW IDLE, MID IDLE, and HIGH IDLE (Figure 9).

Variable-Throttle Switch

The variable-throttle switch allows the engine speed to be adjusted in small increments. Press the "+" once to increase the engine speed and the "-" once to decrease the engine speed (Figure 10).

Note: Moving the throttle switch overrides and cancels the variable-throttle setting.

Important: Do not operate the engine below 1350 rpm.

Key Switch

The key switch (Figure 10) has 3 positions: STOP, RUN/PREHEAT, and START.

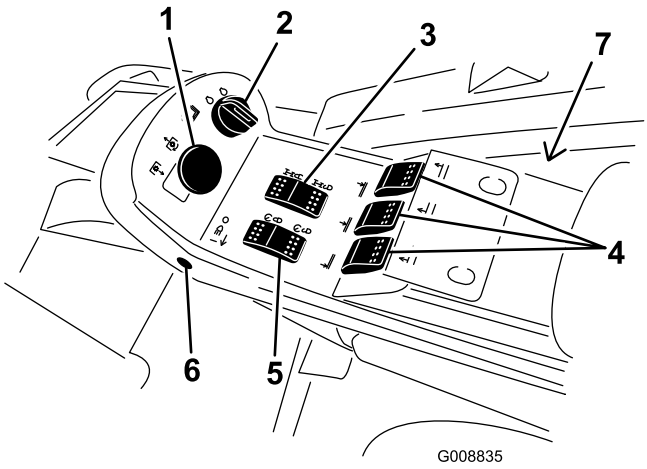


Figure 10

1. PTO switch
2. Key switch
3. Traction-assist switch
4. Lift switches
5. Cruise control
6. Light switch
7. Power point (on the right side of console)

Lift Switches

The lift switches raise and lower the mower decks (Figure 10).

Press the switches forward to lower the mower deck and backward to raise it.

Note: The decks do not lower while the machine is in the HIGH-speed range, and the decks do not raise or lower if you are out of the seat while the engine is running.

Light Switch

Press the light switch upward to turn the lights to the ON position (Figure 10).

Press the light switch downward to turn the lights to the OFF position.

PTO Switch

The PTO switch has 2 positions: OUT (start) and IN (stop). Pull out the PTO button to engage the implement or mower-deck blades. Push in the button to disengage the implement operation (Figure 10).

Traction-Assist Switch

When mowing (low speed range), press and hold the traction-assist switch to enhance the traction-drive performance in compromised operating conditions (Figure 10).

Note: The traction assist only engages in Mow- Forward. The traction assist does not engage in Mow-Reverse or High speed range.

Cruise-Control Switch

The cruise-control switch sets your desired speed of the machine.

Press the switch forward to engage the cruise control and rearward to disengage it (Figure 10).

Audible Alarm (Console)

The alarm is activated when a fault is detected.

The buzzer sounds when the following occur:

- When the engine sends a stop fault
- When the engine sends a check-engine fault
- When the fuel level is low

Cab Controls

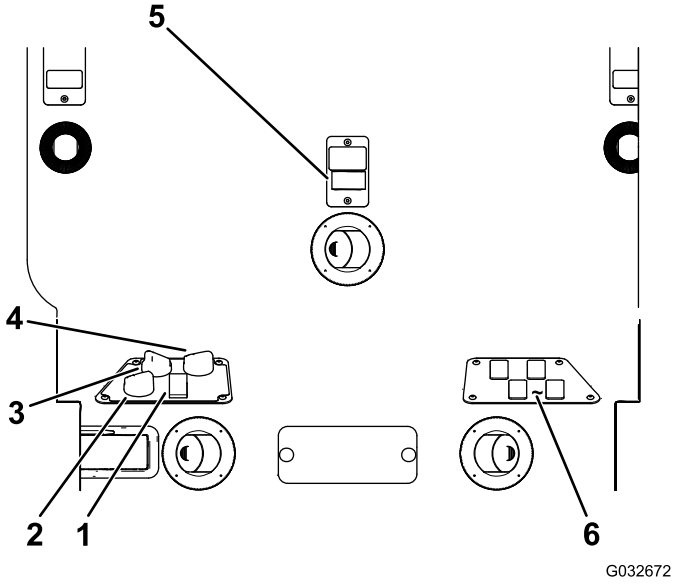


Figure 11

1. Air-conditioning switch
2. Air-recirculation control
3. Fan control
4. Temperature control
5. Windshield-wiper switch
6. Blank switches for optional kits

Air-Recirculation Control

This control either recirculates the air in the cabin or draws outside air into the cabin (Figure 11).

- Set it to recirculate the air when using air conditioning.
- Set it to draw air in when using the heater or fan.

Fan Control

Rotate the fan-control knob to regulate the speed of the fan (Figure 11).

Temperature Control

Rotate the temperature-control knob to regulate the air temperature in the cab (Figure 11).

Windshield-Wiper Switch

Use the windshield-wiper switch to turn the windshield wipers to the ON or OFF position (Figure 11).

Lights Switch

Use the lights switch to turn the headlights and tail-lights to the ON or OFF position (Figure 10).

Flashers Switch

Use the flashers switch to turn the flashers (hazard lights) to the ON or OFF position (Figure 10).

Air-Conditioning Switch

Use the air-conditioning switch to turn the air conditioning on or off (Figure 11).

Windshield Latch

Lift up the latch to open the windshield (Figure 12). Press in the latch to lock the windshield in the open position. Pull out and down on the latch to close and secure the windshield.

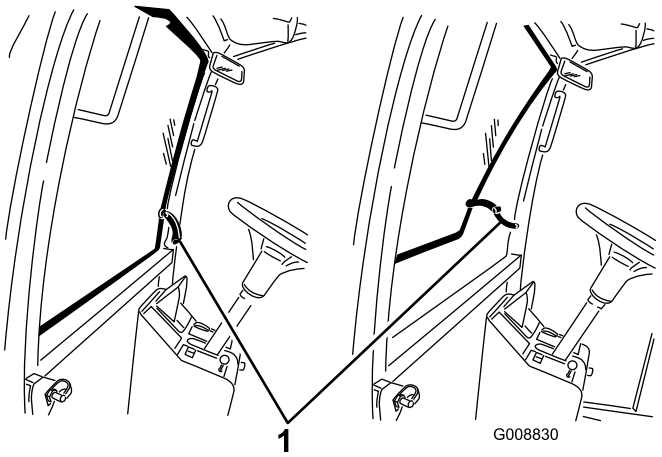


Figure 12

1. Windshield latch

Rear-Window Latch

Lift up the latch to open the rear window. Press in the latch to lock the window in the open position. Pull out and down on the latch to close and secure the window (Figure 12).

Important: You must close the rear window before opening the hood; otherwise, you may damage the window.

Power Point

The power point, located next to the console on the side of the power center, is used to power optional electrical accessories (Figure 10).

Seat-Adjusting Lever

Pull out the lever to slide the seat forward or rearward.

Seat-Back-Adjusting Lever

Move the lever to adjust the seat-back angle.

Armrest-Adjusting Knob

Rotate the knob to adjust the angle of the armrest.

Info Center

Screen Functions

- Press the corresponding button to view screen 1 or screen 2, to stop the audible alarm, to view the fault screen, or to exit (Figure 13).

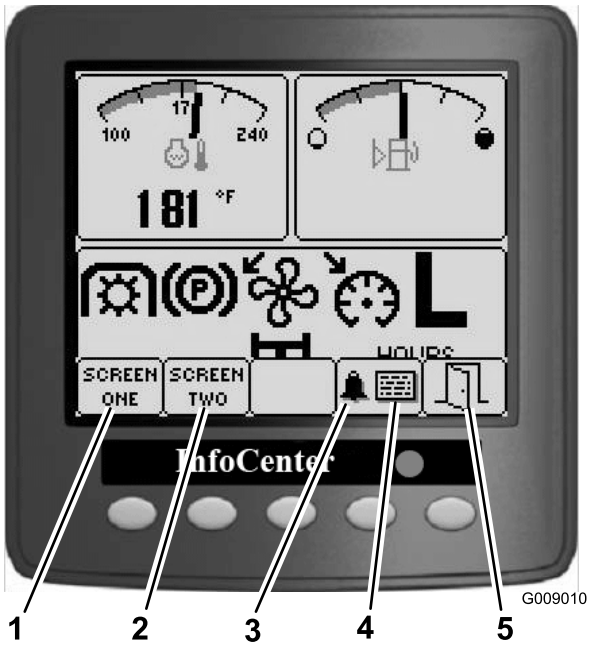


Figure 13

1. Screen 1
2. Screen 2
3. Audible alarm
4. Fault screen
5. Exit

- If a fault appears on the screen, press any key to view the active fault advisory.

  Note: Contact your supervisor or mechanic to relay the fault advisory and determine the course of action.

- Press the arrow keys to navigate the fault screen.
- Press any key to reveal the information keys on the screen.

Operator Information

There are 2 screens that monitor and display the machine functions that you can use.

Screen 1 displays the following:

- Top, Left Gauge—Engine-Coolant Temperature
- Top, Right Gauge—Fuel Level
- Left to Right on the Bottom Half
  1. PTO Engaged
  2. Parking Brake Engaged
  3. Fan Reversing
  4. Cruise Control Engaged
  5. H/L (High/Low speed range)
- Bottom, Left Corner—Air-Intake Heater Active
- Bottom, Middle—Traction Assist Engaged
- Bottom, Right—Machine Hours

Screen 2 displays the following:

- Top, Left Corner—Engine rpm
- Top, Right Corner—Hydraulic-Oil Temperature
- Lower, Left Corner—Battery Voltage
- Lower, Right Corner—Service Due

Engine-Coolant-Temperature Indicator

This display indicates the temperature of the engine coolant (Figure 14).

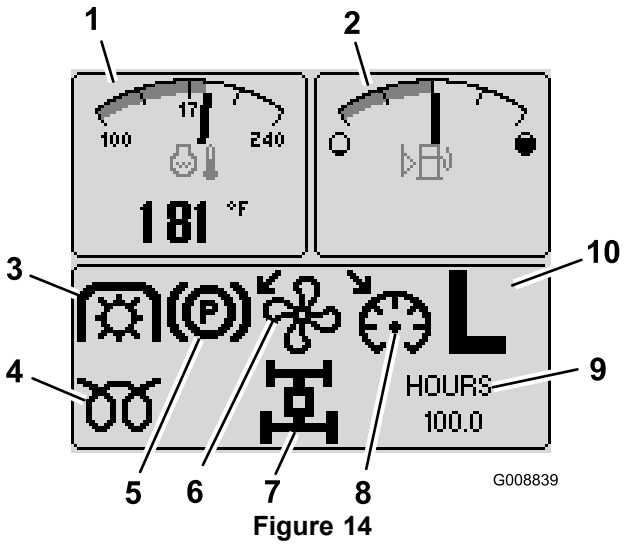


Figure 14

1. Engine-coolant-temperature indicator
2. Fuel-level indicator
3. PTO indicator
4. Air-intake-heater indicator
5. Parking-brake indicator
6. Fan-reverse indicator
7. Traction-assist indicator
8. Cruise-control indicator
9. Machine-hours indicator
10. H / L (High / Low) speed-range indicator

Fuel-Level Indicator

This display indicates the level of fuel in the tank (Figure 14).

PTO Indicator

This display indicates when the PTO in engaged (Figure 14) .

Parking-Brake Indicator

This display indicates that the parking brake is engaged (Figure 14).

Fan-Reverse Indicator

This display indicates when the fan is operating in reverse (Figure 14). The fan speed is controlled by the hydraulic-oil temperature, air-intake temperature, or engine-coolant temperature, and automatically reverses. A reverse cycle is automatically initiated to help blow debris off the rear-hood screen, when either the temperature of the engine coolant or the hydraulic-oil reaches a certain point.

Cruise-Control Indicator

This display indicates when the cruise control is in operation (Figure 14).

H / L (High/Low Range) Speed-Range Indicator

This display indicates the selected speed range (Figure 14).

Air-Intake-Heater Indicator

This display indicates when the system is pre heating (Figure 14).

Traction-Assist Indicator

This display indicates when the traction assist is engaged (Figure 14).

Machine-Hours Indicator

This display shows the total hours that the machine has been operated (Figure 15).

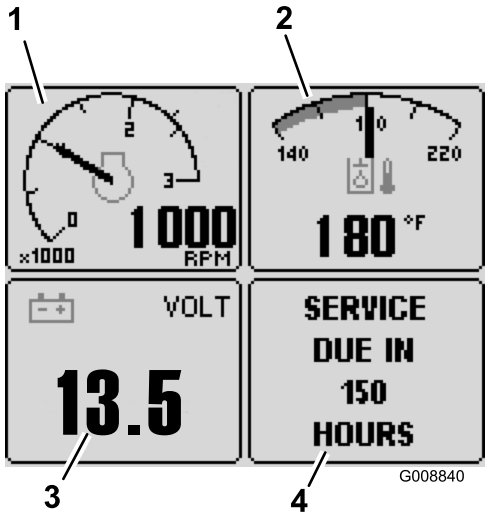


Figure 15

1. Tachometer
2. Hydraulic-oil temperature
3. Battery voltage
4. Service due

Tachometer

This display shows the engine-operating speed in rpm (Figure 15).

Hydraulic-Oil-Temperature Indicator

This display indicates the hydraulic-oil temperature (Figure 15).

Battery Voltage

This display shows the battery voltage (Figure 15).

Service-Due Indicator

This display indicates the time until the next regular service interval (Figure 15).

Note: After you service the machine, reset the indicator.

Resetting the Service-Interval Indicator

1. Press and hold the far, right button on the InfoCenter.

   Note: The Main Menu screen appears.
2. Select Service using the 2 buttons on the left; press the button below the right arrow to continue.
3. Select Hours and press the button below the right arrow.
4. Press the button below Reset Hours.
5. Select the Hours for the appropriate next service time and press the button below the right arrow.

   Note: A check mark appears once the indicator has been reset.
6. When you are finished, press the button below the exit icon (picture of an open door) to return to the main screen, or press cancel to exit.

Engine Air Filter Restriction Indicator

This display indicates when the engine air filter is restricted (Figure 16).

Figure 16

Alarm (InfoCenter)

The alarm on the Info Center sounds when the following occurs:

- It receives an engine fault.
- It receives an advisory or fault from the TEC controllers.
- You are starting the machine.

InfoCenter Fault Indicators

Stop the machine if the driver receives a Stop indication. You should cease operating the machine and the engine as quickly and as safely as possible to reduce damage to the engine (Figure 17).

Figure 17
Fault Example

1. Fault screen

Check the engine if you receive a Check Engine indication for a maintenance fault. You should take the machine to a service center as soon as possible.

InfoCenter Advisories

The InfoCenter advisories provide additional information to operate certain functions on the machine (Figure 18).

Figure 18
Advisory Example

1. Advisory screen

To Set the Cruise Control

Increase the ground speed.

To Float the Deck

Lower the decks.

To Lower the Deck

1. The operator must be seated.
2. Select the low range.
3. Set the parking brake.

Electronics Issues

1. Fix the High/Low range switch.
2. Controller firmware incompatible.
3. Blown the fuse.
4. HHDT ready.

Engine

1. Lower the engine speed.
2. Wait to shutoff the engine.

Fuel Level

Add the fuel.

To Engage PTO

1. Solve the engine fault.
2. Let the engine warm up.
3. Let the hydraulic oil warm.
4. Lower the decks.
5. Must be in the low range.
6. Operator must be seated.

To Set High Range

1. Disengage the cruise.
2. Disengage the PTO.
3. Lift the left deck.
4. Lift the center deck.
5. Lift the right deck.
6. Reduce the ground speed.

To Set Low Range

1. Disengage the cruise.
2. Reduce the ground speed.

To Start

1. Disengage the deck switch.
2. Disengage the PTO.
3. Move the traction pedal to NEUTRAL.
4. Insert the jumper in teach plug.
5. Engine running.
6. Operator must be seated or set the parking brake.
7. Turn the key switch off then on.
8. Wait.

For Teach (Traction Pedal Calibration)

Turn the key switch off then on.

For Traction

1. Fix the critical sensor error.
2. Fix the critical voltage error.
3. Release the parking brake.
4. Move the traction pedal to NEUTRAL.
5. Operator must be seated.

For Traction Assist

1. Must be in the low range.
2. Operator must be seated.

Traction Derate Due To

1. Requires service.
2. Engine or hydraulics too hot.
3. Traction pedal sensor needs calibration.
4. Reserved 1
5. Reserved 2
6. Reserved 3

Specifications

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

Width of cut	
Overall	488 cm (192 inches)
Front mower deck	234 cm (92 inches)
Side mower deck	145 cm (57 inches)
Front and one side mower deck	361 cm (142 inches)
Overall width	
Mower decks down	505 cm (199 inches)
Mower decks up (transports)	251 cm (99 inches)
Overall height	
With ROPS	226 cm (89 inches)
Without ROPS	152 cm (60 inches)
With cab	236 cm (93 inches)
Overall length	445 cm (175 inches)
Minimum ground clearance (at machine centerline)	24 cm (9.5 inches)
Wheel tread (to center of tire)	
Front	63 inches (160 cm)
Rear	56 inches (142 cm)
Wheel tread (to outside of tire)	
Front	193 cm (76 inches)
Rear	168 cm (66 inches)
Wheel base	193 cm (76 inches)
Net Weight (with mower decks)	
Without cab	2706 kg (5966 lb)
With cab	2929 kg (6457 lb)

Attachments/Accessories

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

To best protect your investment and maintain optimal performance of your Toro equipment, count on Toro genuine parts. When it comes to reliability, Toro delivers replacement parts designed to the exact engineering specification of our equipment. For peace of mind, insist on Toro genuine parts.

Operation

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

Before Operation

Before Operation Safety

General Safety

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

Fuel Safety

⚠ DANGER

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

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

⚠ WARNING

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

- **Avoid prolonged breathing of vapors.**
- **Keep your hands and face away from the nozzle and the fuel-tank opening.**
- **Keep fuel away from your eyes and skin.**

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

Checking the Engine-Oil Level

Before you start the engine and use the machine, check the oil level in the engine crankcase; refer to Checking the Engine-Oil Level (page 43).

Checking the Cooling System

Before you start the engine and use the machine, check the cooling system; refer to Checking the Cooling System (page 51).

Checking the Hydraulic System

Before you start the engine and use the machine, check the hydraulic system; refer to Checking the Hydraulic Fluid (page 55).

Filling the Fuel Tank

Recommended Fuel

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

Fuel-tank capacity: 132 L (35 US gallons)

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

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

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

Biodiesel Ready

This machine can also use a biodiesel blended fuel of up to B20 (20% biodiesel, 80% petrodiesel). The petrodiesel portion should be 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, and gaskets in contact with fuel as they may degrade over time.
- Fuel-filter plugging may be expected for a time after converting to biodiesel blended.
- Contact your distributor if you wish more information on biodiesel.

Filling the Fuel Tank

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

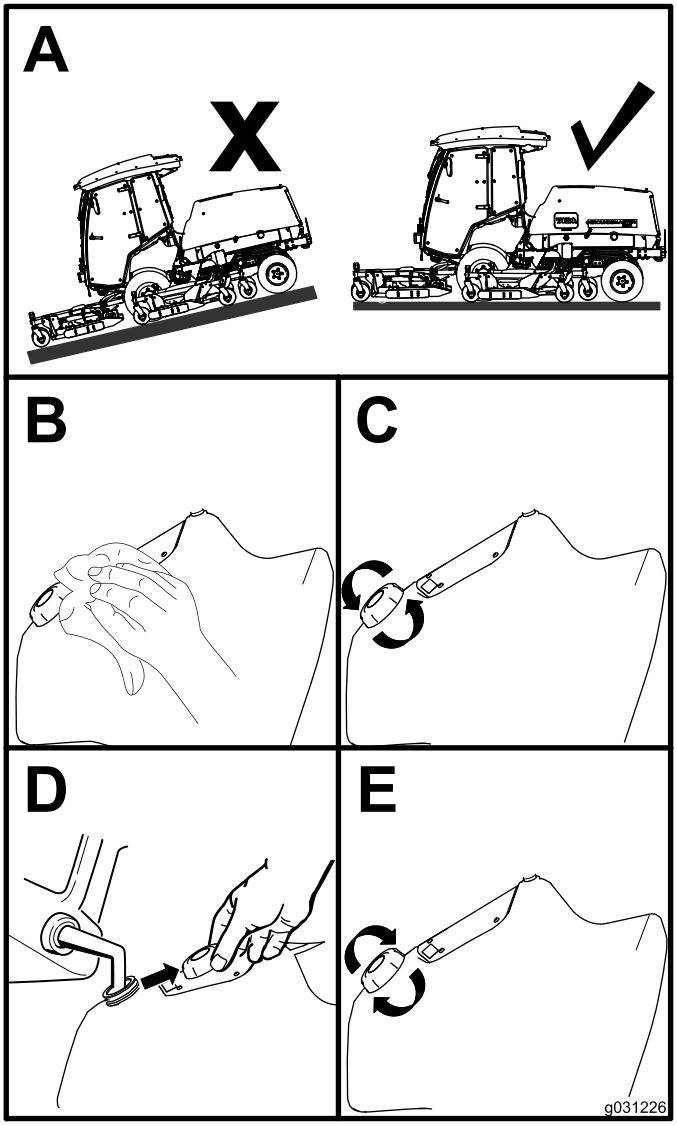


Figure 19

Checking the Tire Pressure

Service Interval: Before each use or daily

The correct air pressure in the front tires is 345 kPa (50 psi) and the rear tires is 207 kPa (30 psi) as shown in (Figure 20).

Important: Maintain pressure in all tires to ensure a good quality of cut and proper machine performance. *Do not underinflate the tires.*

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

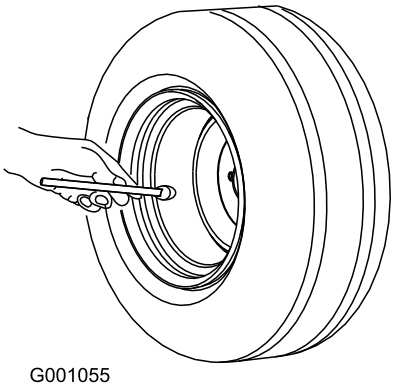


Figure 20

Checking the Torque of the Wheel-Lug Nuts

Service Interval: After the first 10 hours

Every 250 hours

⚠ WARNING

Failure to maintain the proper torque of the wheel nuts could result in failure or loss of a wheel, and may result in personal injury.

Torque the front and rear wheel nuts to 95 to 122 N·m (70 to 90 ft-lb) after 10 hours of operation. Torque the nuts every 250 hours thereafter.

Adjusting the Height of Cut

You can adjust the height of cut from 25 to 153 mm (1 to 6 inches) in 13 mm (1/2 inch) increments. To adjust the height of cut, position the castor-wheel axles in the upper or lower holes of the castor forks, add or remove an equal number of spacers from the castor forks, and adjust the rear chain (front deck only) to the desired holes.

Adjusting the Front Mower Deck

1. Start the engine and raise the mower decks so you can change the height of cut.
2. Shut off the engine and remove the key after raising the mower deck.
3. Position the castor-wheel axles in the same holes in all castor forks; refer to the chart (Figure 21) to determine the correct holes for the setting.

   Note: To prevent grass buildup between the wheel and the fork, operate the machine at the 64 mm (2-1/2 inch) height of cut or higher and install the axle bolt in the bottom caster-fork hole. When operating the machine at a height of cut lower than 64 mm (2-1/2 inches) and when you detect grass buildup, reverse the direction of the machine to pull any clippings away from the wheel and fork.

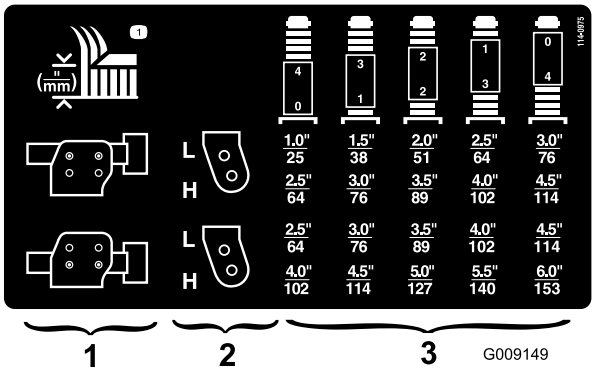


Figure 21

1. Castor-arm height-of cut mounting holes
2. Castor-fork height-of cut mounting holes
3. Castor-fork height-of cut spacers

4. Install 2 shims onto the caster shaft as originally installed and slide the appropriate number of spacers onto the shaft to get the desired height of cut.

   Note: Refer to the chart to determine the combinations of spacers for the setting (Figure 21).

   Note: You may use the shims in any combination above or below the caster-arm hub (as required) to achieve the desired height of cut or deck level.
5. Push the caster shaft through the front caster arm.
6. Install the shims (as originally installed) and the remaining spacers onto the shaft (Figure 22).

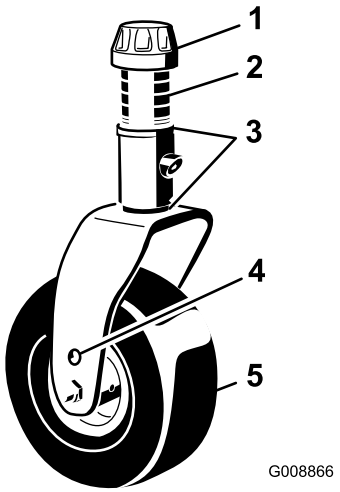


Figure 22

1. Tensioning cap
2. Spacers (4)
3. Shims (4)
4. Top axle mounting bolt
5. Castor wheel

7. Install the tensioning cap to secure the assembly (Figure 22).
8. Remove the hairpin cotter and clevis pin securing the height-of-cut chains to the rear of the mower deck (Figure 23).

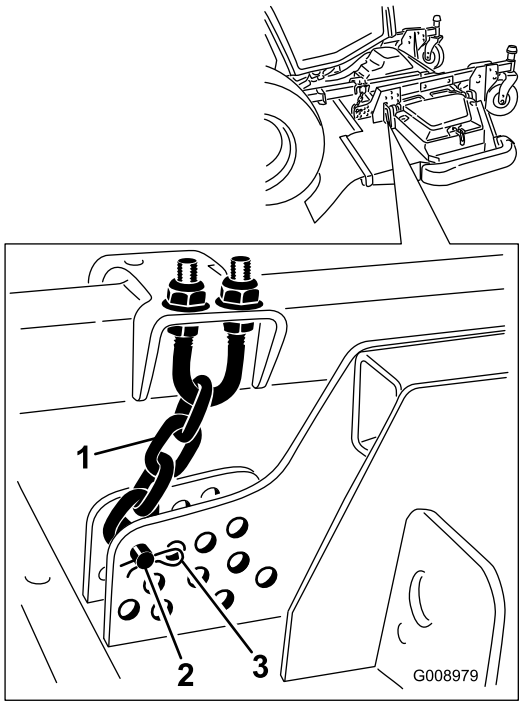


Figure 23

1. Height-of-cut chain
2. Clevis pin
3. Hairpin cotter

9. Mount the height-of-cut chains to the desired height-of-cut hole with the clevis pin and hairpin cotter (Figure 24).

Note: When mowing at a height of cut below 51 mm (2-1/2 inches), move the skids, gage wheels, and rollers to the highest holes.

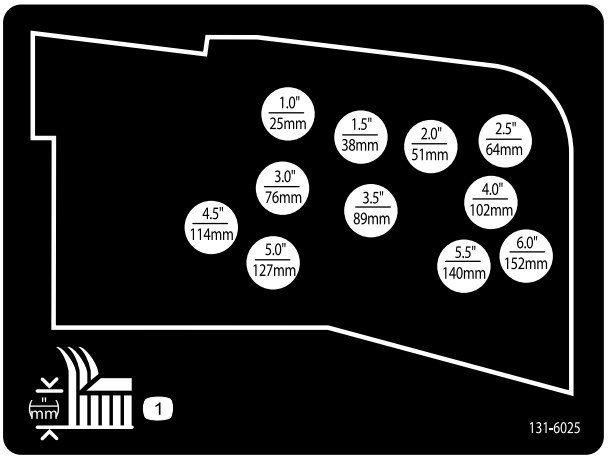


Figure 24

10. To attain the 102 to 153 mm (5 to 6 inch) height-of cut settings, remove the mounting bolts securing the deck-hanger brackets to the height-of cut castor arms and mount the deck-hanger brackets to the height-of cut castor arms using the lower set of holes (Figure 25).

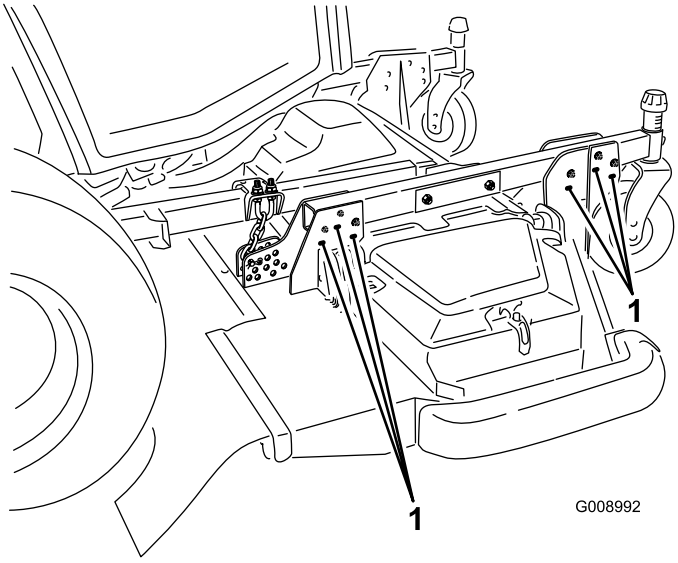


Figure 25

1. Lower mounting bolts

Adjusting the Side Mower Decks

1. Start the engine and raise the mower decks so you can change the height of cut.
2. Shut off the engine and remove the key after you raise the mower deck.
3. Position the castor wheel axles in the same holes in all castor forks; refer to the chart (Figure 26) to determine the correct holes for the height-of cut setting.

Note: To prevent grass buildup between the wheel and the fork, operate the machine at the 64 mm (2-1/2 inch) height of cut or higher and install the axle bolt in the bottom caster-fork hole. When operating the machine at a height of cut lower than 64 mm (2-1/2 inches) and when you detect grass buildup, reverse the direction of the machine to pull any clippings away from the wheel and fork.

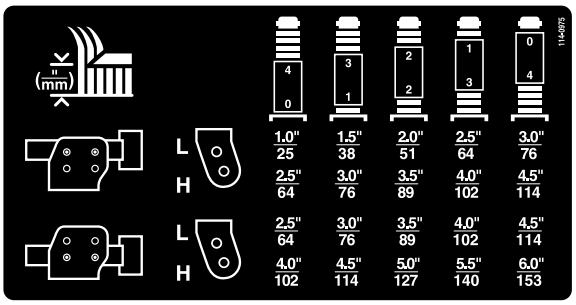


Figure 26

4. Remove the tensioning cap from the caster-spindle shaft and slide the caster shaft out of the caster arm (Figure 27).

Note: You may use shims in any combination above or below the caster arm hub as required to achieve the desired height of cut or deck level.

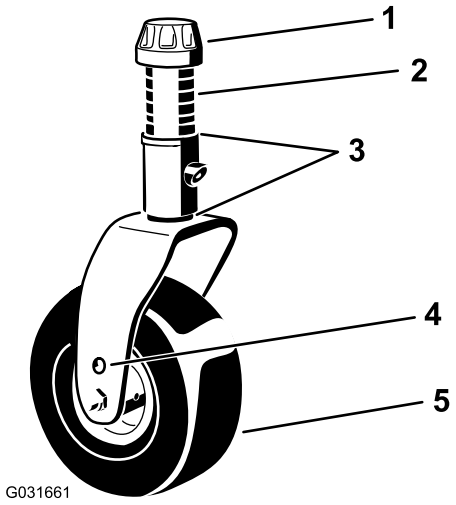


Figure 27

1. Tensioning cap
2. Spacers (6)
3. Shims (2 top and 2 bottom)
4. Top axle-mounting hole
5. Caster wheel

5. Install 2 shims onto the shaft as originally installed and slide the appropriate number of spacers onto the shaft to get the desired height of cut.
6. Push the caster shaft through the caster arm.
7. Install the shims (as originally installed) and the remaining spacers onto the shaft.
8. Install the tensioning cap to secure the assembly.

Adjusting the Skids

Mount the skids in the lower position when operating at heights of cut greater than 64 mm (2-1/2 inches) and in the higher position when operating at heights of cut lower than 64 mm (2-1/2 inches).

Note: When the skids become worn, you can switch them to the opposite sides of the mower by flipping them over. This allows you to use the outer skids longer before replacing them.

Adjust the skids (Figure 28).

Important: Torque the screw at the front of each skid to 9 to 11 N m (80 to 100 in-lb).

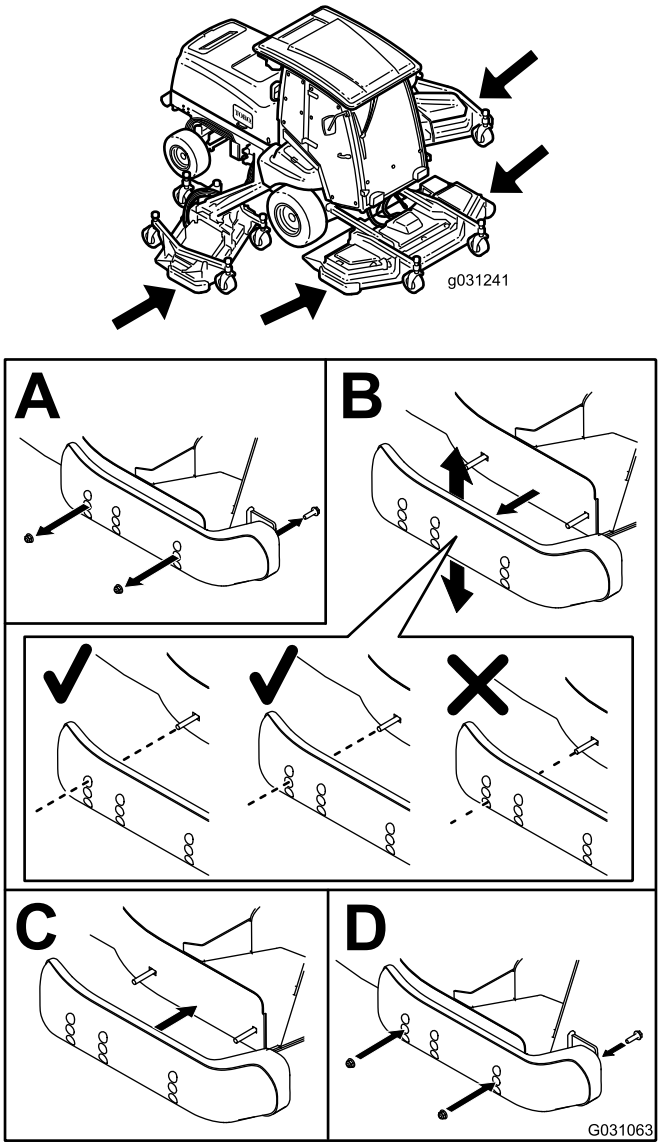


Figure 28

Adjusting the Mower Deck Anti-Scalp Rollers

Mount the mower-deck gage wheels and roller in the lower position when operating at heights of cut greater than 64 mm (2-1/2 inches) and in the higher position when operating at heights of cut lower than 64 mm (2-1/2 inches).

Adjusting the Roller

1. Remove the screw and nut securing the roller shaft to the deck bracket (Figure 29).

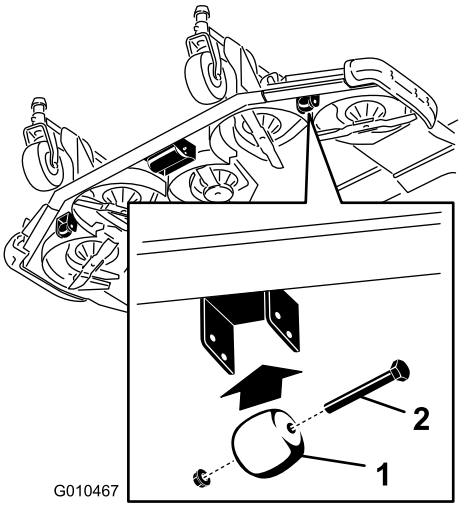


Figure 29

1. Gage wheel
2. Screw and nut

2. Slide the shaft out of the lower bracket holes, align the roller with the top holes, and install the shaft (Figure 30).

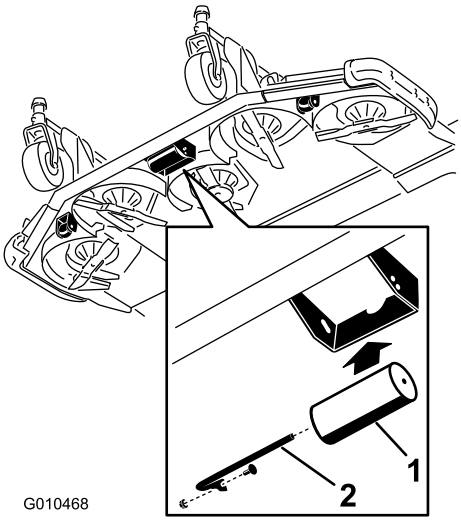


Figure 30

1. Roller
2. Roller shaft, screw, and nut

3. Install the screw and nut to secure the assemblies.

Adjusting the Gage Wheels

1. Remove the bolt and nut securing the gage wheel to the mower-deck brackets (Figure 29).
2. Align the roller and spacer with the top holes in the brackets and secure them with the bolt and nut.

Checking a Mismatch Between Mower Decks

Due to differences in grass conditions and the counterbalance setting of the traction unit, you should cut the grass and check the appearance before you begin cutting the entire area.

1. Set all mower decks to the desired height of cut; refer to Adjusting the Height of Cut (page 26).
2. Check and adjust front and rear tire pressure.

   Note: The correct air pressure in the front tires is 345 kPa (50 psi) and the rear tires is 207 kPa (30 psi).
3. Check and adjust all castor tire pressures to 345 kPa (50 psi).
4. Check the lift and counterbalance pressures with engine at HIGH IDLE using the test ports; refer to Inspecting the Hydraulic-System Test Ports (page 57).
5. Check for bent blades; refer to Checking for a Bent Blade (page 60).
6. Cut grass in a test area to determine if all mower decks are cutting at the same height.
7. If you need to adjust a mower deck, find a flat surface using a 2 m (6 ft) or longer straight edge to ensure that the surface is flat.
8. To ease measuring blade plane, raise the height of cut to the highest position; refer to Adjusting the Height of Cut (page 26).
9. Lower the mower decks onto the flat surface and remove the covers from the top of the mower decks.

Side Mower Decks

1. Rotate the blade of each spindle until the ends face forward and backward.
2. For the outside blade spindle only, equally adjust the shims on the front caster forks to match the desired height of cut.
3. Measure from the floor to the front tip of the cutting blade.
4. Rotate the blade 180° and measure from the floor to the tip of the cutting blade.

   Note: The rear of the blade should be 7.5 mm (0.3 inch) higher than the front.

   Note: If you need to make an adjustment, adjust the shims on the rear caster forks.

Matching the Height of Cut Between Mower Decks

1. Position the blade side to side on the outside spindle of both side mower decks.
2. Measure from the floor to the tip of the cutting edge on both units and compare the measurements.

   Note: These numbers should be within 3 mm (1/8 inch) of each other. Make no adjustment at this time.
3. Position the blade side to side on the inside spindle of side mower deck and the corresponding outside spindle of the front mower deck.
4. Measure from the floor to the tip of the cutting edge on the inside edge of the side mower deck to the corresponding outside edge of the front mower deck and compare.

   Note: The side mower-deck caster wheels should remain on the ground with counterbalance applied.

   Note: If you need to make an adjustment to match the cut between the front and side mower decks, make them to the **side mower decks only**.
5. If the inside edge of the side mower deck is too high relative to the outside edge of the front mower deck, remove 1 shim from the bottom of the front, inside caster arm on the side mower deck(Figure 31 and Figure 32).

   Note: Check the measurement between the outside edges of both side mower decks and the inside edge of the side mower deck to outside edge of the front mower deck again.

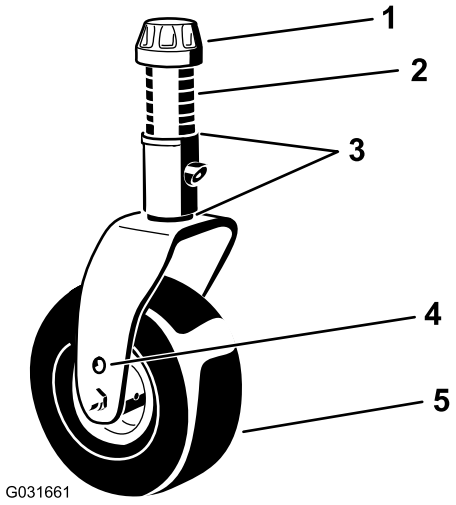


Figure 31

1. Tensioning cap
2. Spacers (6)
3. Shims (2 top and 2 bottom)
4. Top axle-mounting hole
5. Caster wheel

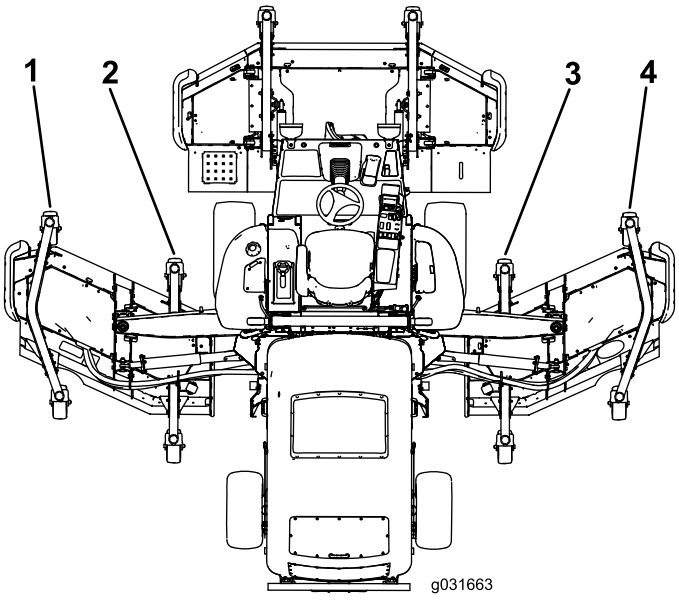


Figure 32

1. Left, front, outside caster arm
2. Left, front, inside caster arm
3. Right, front, inside caster arm
4. Right, front, outside caster arm

6. If the inside edge is still too high, remove an additional shim from the bottom of the front, inside caster arm of the side mower deck and 1 shim from the front, outside caster arm of the side mower deck (Figure 31 and Figure 32).
7. If the inside edge of the side mower deck is too low relative to the outside edge of the front mower deck, add 1 shim (1/8 inch) to the bottom of the front, inside caster arm on the side mower deck (Figure 31 and Figure 32).

   Note: Check the measurement between the outside edges of both side mower decks and the inside edge of the side mower deck to the outside edge of the front mower deck again.
8. If the inside edge is still too low, add an additional shim to the bottom of front, inside caster arm of the side mower deck and 1 shim to the front, outside caster arm of the side mower deck.
9. Once the cutting height matches at the edges of the front and side mower decks, verify that the side mower-deck pitch is still 7.6 mm (0.3 inch).

Adjusting the Mirrors

Rear-View Mirror

While sitting in the seat, adjust the rear-view mirror to attain the best view out of the rear window. Pull the lever rearward to tilt the mirror to reduce the brightness and glare of light (Figure 33).

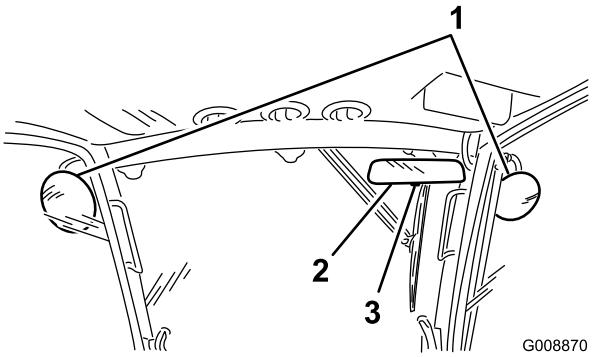


Figure 33

1. Side-view mirrors
2. Rear-view mirror
3. Lever

Side-View Mirrors

While sitting in the seat, have another person adjust the side-view mirrors to attain the best view around the side of the machine (Figure 33).

Aiming the Headlights

1. Loosen the mounting nuts and position each headlight so that it points straight ahead.

   Note: Tighten the mounting nut just enough to hold the headlight in position.
2. Place a flat piece of sheet metal over the face of the headlight.
3. Mount a magnetic protractor onto the plate.
4. While holding the assembly in place, carefully tilt the headlight downward 3° then tighten the nut.
5. Repeat this procedure on the other headlight.

Checking the Safety-Interlock Switches

⚠ CAUTION

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

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

The machine has interlock switches in the electrical system. These switches are designed to stop the engine when you get off the seat when the traction pedal is **not** in the NEUTRAL position or the PTO is engaged. However, you may get off the seat while the engine is running, the traction pedal is in NEUTRAL, and the parking brake is engaged.

1. Drive the machine slowly to a large, open area.
2. Lower the mower deck(s), shut off the engine, and engage the parking brake.

Checking the Traction-Neutral Safety-Interlock Function

1. Move the traction pedal out of the NEUTRAL position and start the engine.

   Note: The engine should not start. If it does start, there is a malfunction in the interlock system that you should correct before resuming operation.
2. Remove your foot from the traction pedal, start the engine, and engage the parking brake.
3. With the engine running, move the traction pedal out of the NEUTRAL position.

   Note: The traction drive should not function. If it does function, there is a malfunction in the interlock system that you should correct before resuming operation.

Checking the PTO Safety-Interlock Function

1. Start the engine.
2. With the engine running, rise from the seat and engage the PTO.

   Note: The PTO should not engage. If it does engage, there is a malfunction in the interlock system that you should correct before resuming operation.
3. Sit on the seat and disengage the PTO.
4. With the engine running, engage the PTO and rise from the seat.

   Note: The engine should shut off. If it does not shut off, there is a malfunction in the interlock system that you should correct before resuming operation.
5. Sit on the seat, disengage the PTO, and start the engine.
6. With the engine running, engage the PTO and raise each mower deck individually.

   Note: The blades of the raised mower deck should stop. If the blades do not stop, there is a malfunction in the interlock system that you should correct before resuming operation.

During Operation

During Operation Safety

General Safety

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

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

Rollover Protection System (ROPS) Safety

- **Do not** remove the ROPS from the machine.
- Ensure that the seat belt is attached and that you can release it quickly in the event of an emergency.
- Always wear your seat belt when the ROPS is up.
- Check carefully for overhead clearances, such as branches, doorways, and electrical wires, before driving the machine under them. Do not contact them.
- Keep the ROPS in safe operating condition by thoroughly inspecting it periodically for damage and keeping all the mounting fasteners tight.
- Replace a damaged ROPS. Do not repair or revise it.
- Any alterations to a ROPS must be approved by The Toro® Company.

Slope Safety

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

Starting and Stopping the Engine

1. Ensure that the parking brake is engaged.
2. Remove your foot from the traction pedal and ensure that it is in the NEUTRAL position.
3. Set the throttle switch to the LOW-IDLE position.
4. Turn the ignition key to the RUN position.
5. When the glow indicator dims, turn the ignition key to the START position.
6. Release the key immediately when the engine starts and allow it to return to the RUN position.
7. Allow the engine to warm up at low speed (without load) for 3 to 5 minutes, then actuate the throttle switch to attain the desired engine speed.

   Important: Do not run the starter motor more than 30 seconds at a time or premature starter failure may result. If the engine fails to start after 30 seconds, turn the key to the OFF position, check the controls and procedures again, wait 2 minutes, and repeat the starting procedure.

   Note: When the temperature is below -7° C (20° F), let the machine warm up for a minimum of 10 minutes.
8. To stop the engine, set the throttle switch to the LOW-IDLE position, move the PTO switch to the OFF position, set the parking brake, and turn the ignition key to OFF.
9. Remove the key from the switch to prevent accidental starting.

Important: Idle the engine for 5 minutes before shutting it off after a full-load operation. Failure to do so may lead to turbo-charger complications.

Understanding the Operating Characteristics

Practice driving the machine, as it has a hydrostatic transmission, and its characteristics may differ from other turf-maintenance machines.

To maintain enough power for the traction unit and implement while operating, regulate the traction pedal to keep the engine speed (rpm) high and constant. Decrease the ground speed as the load on the implement increases, and increase the ground speed as the load decreases.

Allow the traction pedal to move backward as the engine speed (rpm) decreases, and press the pedal slowly as the engine speed increases. By comparison, when driving between work areas, with no load and the mower deck raised, set the throttle in the highest position and press the traction pedal slowly, but fully, to attain maximum ground speed.

Before stopping the engine, disengage all controls and move the throttle to the slowest position, which reduces the engine speed (rpm), noise, and vibration. Turn the ignition key to the OFF position to shut off the engine.

Before transporting the machine, raise the mower decks and secure the transport latches on the side mower deck (Figure 34).

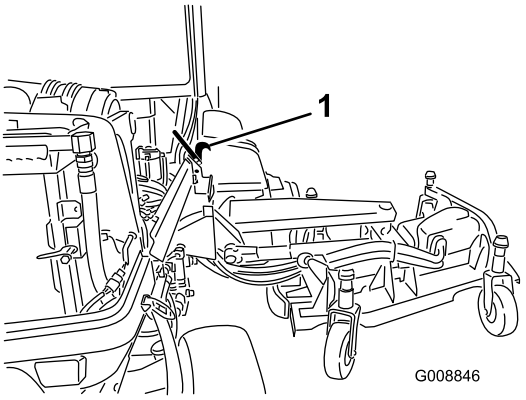


Figure 34

1. Transport latch

Automatic Reversing-Fan Cycle

The hydraulic-fan speed is controlled by the hydraulic-oil temperature. The radiator-fan speed is controlled by the engine-coolant temperature. A reverse cycle automatically initiates when either the engine coolant or hydraulic-oil temperature reaches a certain point. This reversal blows debris off the screens, lowering the engine and hydraulic-oil temperatures (Figure 35).

Figure 35

Operating Tips

Selecting the Proper Height-of-Cut Setting

Remove approximately 25 mm (1 inch) or no more than 1/3 of the grass blade when cutting. In exceptionally lush and dense grass, you may need to raise the height-of-cut to the next setting (Figure 36).

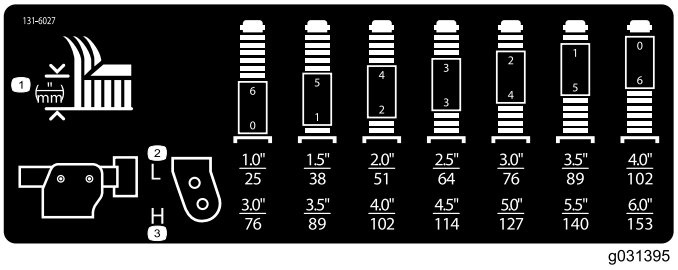


Figure 36

Mowing When Grass is Dry

Mow either in the late morning to avoid the dew, which causes grass clumping, or in late afternoon to avoid the damage that direct sunlight can do to sensitive, freshly mowed grass.

Mowing at Proper Intervals

Under most normal conditions you will need to mow approximately every 4 to 5 days. However, grass grows at different rates at different times. To maintain the same height of cut, which is a good practice, you will need to cut more frequently in early spring; as the grass growth rate slows in mid summer, cut only every 8 to 10 days. If you are unable to mow for an extended period due to weather conditions or other reasons, mow first with a high height of cut; then mow again 2 to 3 days later with a lower height setting.

Transporting the Machine

Use the transport latches when transporting the machine over long distances or rough terrain or when trailering.

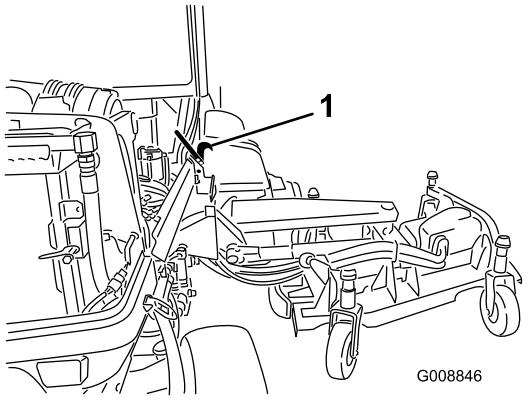


Figure 37

1. Transport latch

After Operating the Machine

To ensure optimum performance, clean the underside of the mower housing after each use. If residue is allowed to build up in the mower housing, cutting performance will decrease.

Mower-Deck Pitch

Mower-deck pitch is the difference in height of cut from the front of the blade plane to the back of the blade plane. Use a blade pitch of 7.6 mm (0.3 inch). A pitch larger than 7.6 mm (0.3 inch) results in less power required, larger clippings, and a poorer quality of cut. A pitch less than 7.6 mm (0.3 inch) results in more power required, smaller clippings, and a better quality of cut.

Maximizing Air-Conditioner Performance

- To limit solar heating, park the machine in a shaded area or leave the doors open in direct sun.
- Ensure that the air-conditioning screen is clean.
- Ensure that the air-conditioning-condenser fins are clean.
- Operate the air-conditioner blower at the mid-speed setting.
- Ensure that there is a continuous seal between the roof and the headliner and correct it as needed.
- Measure the air temperature at the front, center vent in the headliner. This should typically stabilize at less than or equal to 10° C (50° F).
- Refer to the Service Manual for additional information.

After Operation

After Operation Safety

General Safety

- Clean grass and debris from the cutting units, drives, mufflers, and engine to help prevent fires. Clean up oil or fuel spills.
- Shut off the fuel while storing or transporting the machine.
- Disengage the drive to the attachment whenever you are transporting or not using the machine.
- Use full-width ramps for loading the machine into a trailer or truck. Do not exceed a 15° angle between the ramp and the 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.
- Allow the engine to cool before storing the machine in any enclosure.
- Never store the machine or fuel container where there is an open flame, spark, or pilot light, such as on a water heater or on other appliances.

Towing Safety

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

Identifying the Tie-Down Points

Front of the machine—under the front of the operator's platform (Figure 38)

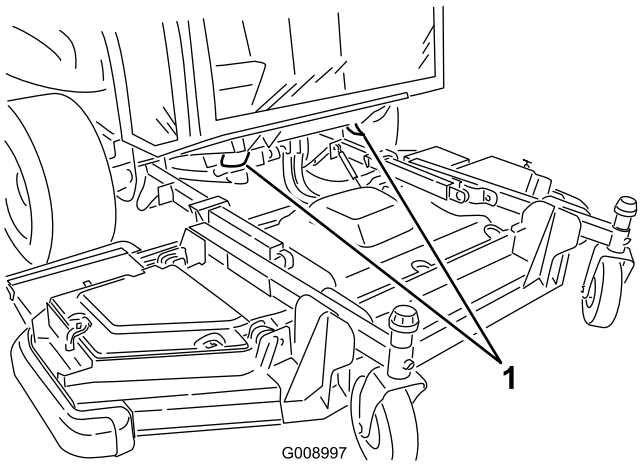


Figure 38

1. Front tie downs

Rear of the machine—on the bumper (Figure 39)

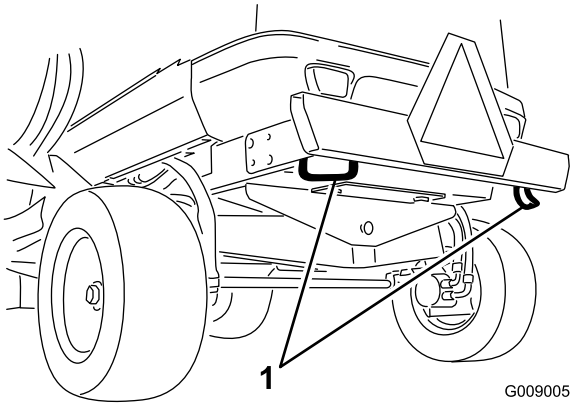


Figure 39

1. Rear tie downs

Pushing or Towing the Machine

Important: Do not push or tow the machine faster than 3 to 4.8 km/h (2 to 3 mph), because internal-transmission damage may occur. Ensure that the bypass valves are open whenever you push or tow the machine.

1. Raise the hood and locate the bypass valves on the pump (Figure 40).

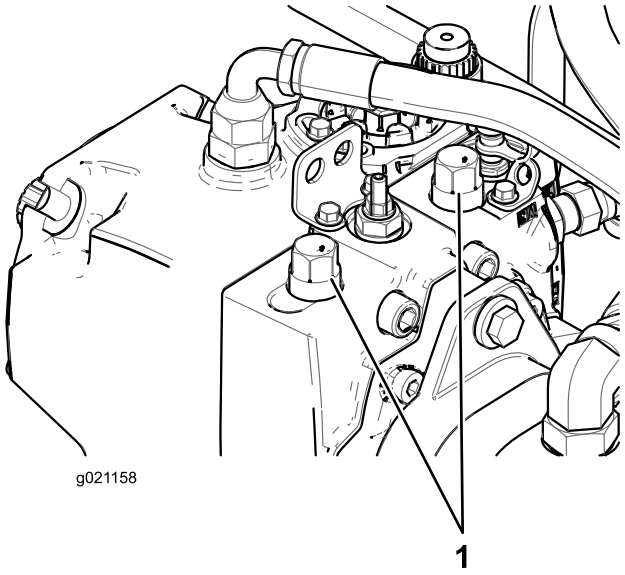


Figure 40

1. Bypass valve

2. Rotate each valve 3 turns counter-clockwise to open and allow oil to bypass internally.

   Important: Do not open the valves more than 3 turns.

   Note: Because fluid is bypassed, you can slowly move the machine without damaging the transmission.

3. Close the bypass valves before starting the engine. Torque to 70 N·m (52 ft-lb) to close the valve.

   Important: If you must push or tow the machine in reverse, you must also bypass the check valve in the 4-wheel-drive manifold. To bypass the check valve, connect a hose assembly (Hose Part No. 95-8843, Coupler Fitting No. 95-0985 [Qty. 2], and Hydraulic Fitting No. 340-77 [Qty. 2]) to the reverse-traction-pressure test port MB, located on the hydrostat and on the test port G2 on the rear traction manifold, located behind the front tire.

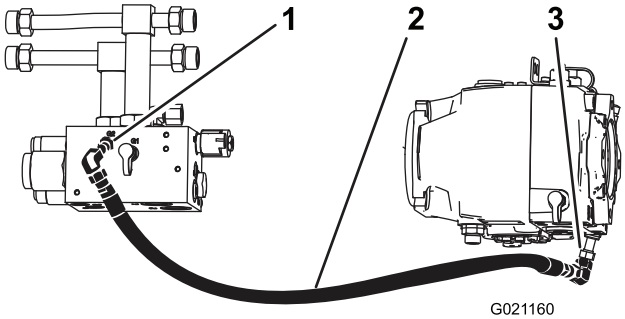


Figure 41

1. Reverse 4-wheel-drive-pressure test port (Port G2)
2. Hose assembly
3. Reverse-traction-pressure test port (Port MB)

Maintenance

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

Important: **Refer to your engine operator's manual for additional maintenance procedures.**

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first 10 hours	• Torque the wheel-lug nuts. • Check the alternator-belt tension. • Check the compressor-belt tension. • Check blade bolt torque
After the first 250 hours	• Adjust the valve clearance. • Change the planetary-drive gear/brake oil.
Before each use or daily	• Check the tire pressure. • Lubricate the caster-arm bushings. • Check the engine-oil level. • Drain the water separator. • Check the coolant level. • Remove debris and chaff from the engine compartment, oil cooler, and radiator (more often in dusty or dirty conditions). • Check the hydraulic fluid level. • Check mower blade condition • Check the safety-interlock-switch operation
Every 50 hours	• Lubricate all grease fittings. • Remove air cleaner cover and clean out debris Do not remove filter. • Check the condition of the battery. • Inspect the blade-drive belts. • Check blade bolt torque • Remove all debris and chaff from the engine compartment, radiator, and oil cooler.
Every 100 hours	• Inspect the cooling-system hoses.
Every 250 hours	• Torque the wheel-lug nuts. • Change the engine oil and filter. • Service the spark arrestor. • Clean the cab air filters; replace them if they are torn or excessively dirty. • Clean the air-conditioning assembly (more frequently in extremely dusty or dirty conditions).
Every 400 hours	• Check the planetary-drive gear/brake-oil level (check if you observe external leakage).
Every 500 hours	• Inspect the fuel lines and connections. • Replace the fuel/water separator element. • Replace the fuel-filter element • Inspect the mower-deck caster-wheel assemblies.
Every 800 hours	• Change the planetary drive gear/brake oil (Or yearly, whichever comes first).
Every 1,000 hours	• Drain and clean the fuel tank. • Calibrate the traction pedal. • Check the rear-wheel toe-in. • Check the alternator-belt tension. • Check the compressor-belt tension. • Replace the blade-drive belts. • Change the hydraulic fluid and filters.

Maintenance Service Interval	Maintenance Procedure
Every 2,000 hours	• Adjust the valve clearance.
Every 2 years	• Flush the cooling system and replace fluid. • Replace moving hoses.

⚠ CAUTION

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

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

Service Interval Chart

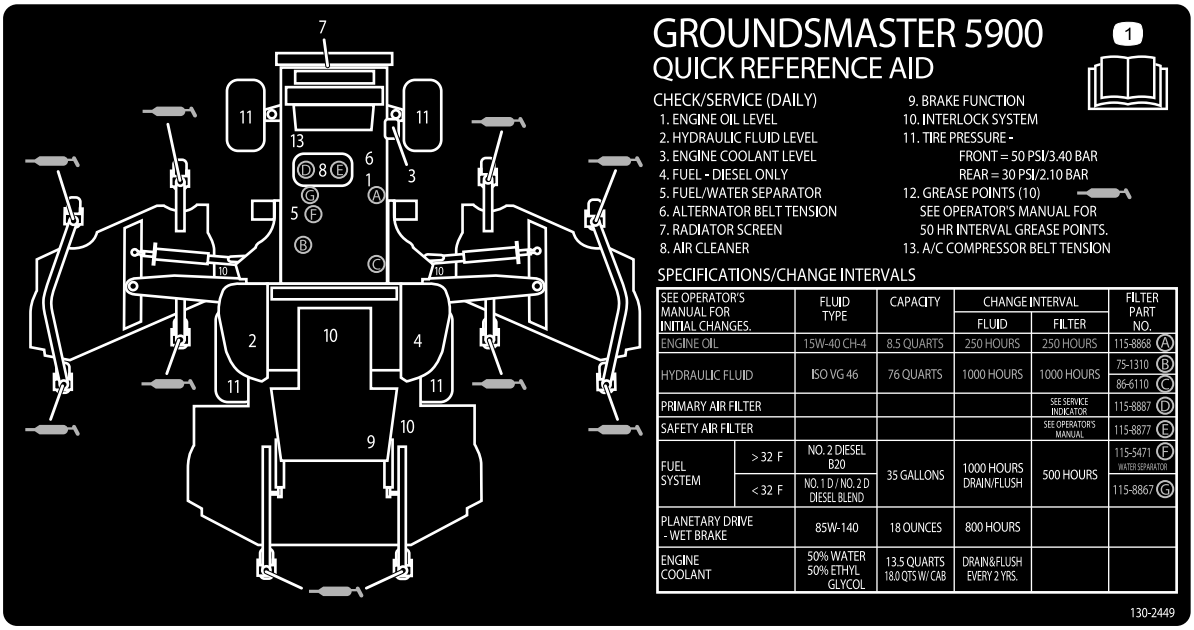


Figure 42

Premaintenance Procedures

Pre-Maintenance Safety

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

- Carefully release pressure from components with stored energy.
- If your machine requires major repairs or if you desire assistance, contact an Authorized Toro Distributor.
- Use only genuine Toro replacement parts and accessories. Replacement parts and accessories made by other manufacturers could be dangerous, and such use could void the product warranty.

Preparing the Machine for Maintenance

1. Ensure that the PTO is disengaged.
2. Park the machine on a level surface.
3. Set the parking brake.
4. Lower the cutting unit(s) if necessary.
5. Shut off the engine and wait for all moving parts to stop.
6. Turn the ignition key to the STOP position and remove it.
7. Allow machine components to cool before performing maintenance.

Raising the Machine

Use the following as points to jack up the machine:

Front of the machine—on the frame, on the inside of each drive tire (Figure 43)

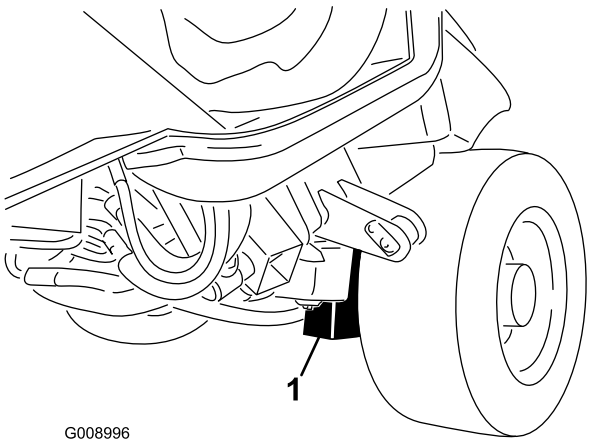


Figure 43

1. Front jacking point (2)

Rear of the machine—at the center of the axle (Figure 44)

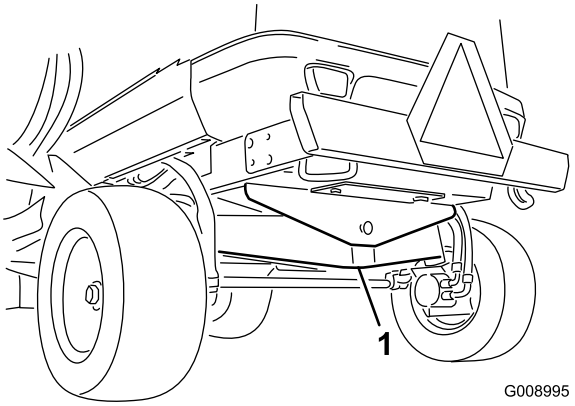


Figure 44

1. Rear jacking point

Removing and Installing the Inner-Wing-Deck Covers

Removing the Inner-Wing-Deck Covers

1. Lower the wing deck onto a level surface.
2. Disengage the cover latch.
3. Remove the bolt securing the belt cover (if equipped).
4. Lift the rear and inside cover edges off the mounting posts (Figure 45).

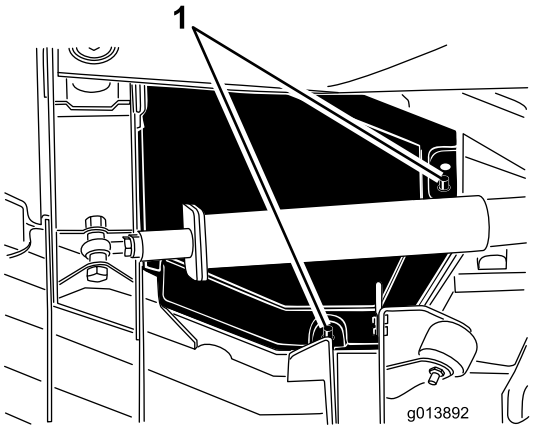


Figure 45

1. Mounting posts

5. While lifting the cover, slide it toward the traction unit approximately 2.5 cm (1 inch), to disengage the outer cover edge from the deck (Figure 46).

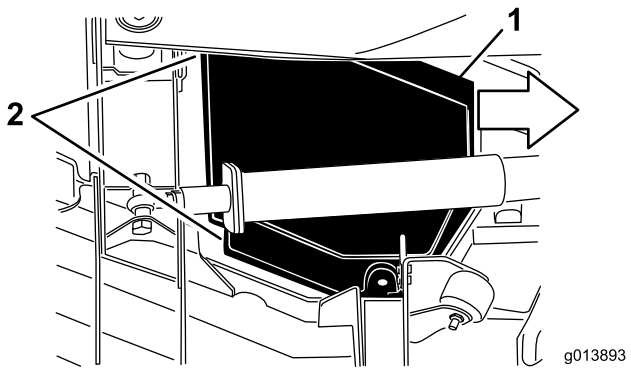


Figure 46

1. Slide the cover inward approximately 2.5 cm (1 inch).
2. Disengage these cover edges.

6. Lift the front edge and guide it between the lift arm and the roller to remove it (Figure 47).

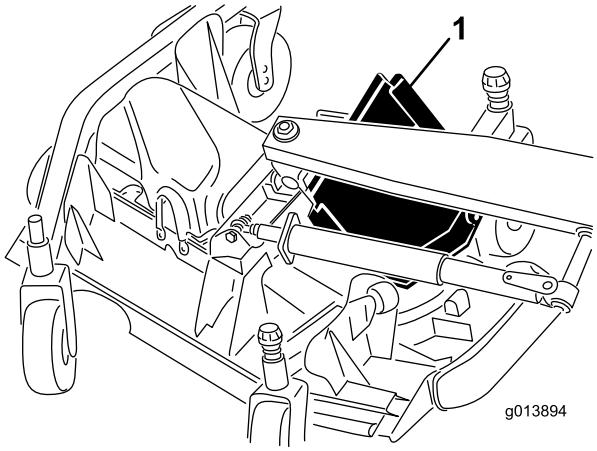


Figure 47

1. Slide the cover out between the lift arm and roller.

Installing the Inner-Wing-Deck Covers

1. Lower the wing deck onto a level surface.
2. Slide the cover into position by guiding the rear edge between the lift arm and the roller.
3. While sliding the cover away from the traction unit, guide the outside edge under the front and rear brackets on the deck.
4. Align the deck mounting posts with the holes in the cover and lower the cover into position.
5. Install the bolt securing the belt cover, if so equipped.
6. Engage the deck-cover latch.

Lubrication

Greasing the Bearings and Bushings

Service Interval: Before each use or daily—Lubricate the caster-arm bushings.

Every 50 hours—Lubricate all grease fittings.

The machine has grease fittings that you must lubricate regularly with No. 2 lithium grease. Also, lubricate the machine immediately after every washing.

Note: Lubricate the caster-fork-shaft bushings before each use or daily.

Traction Unit

- 2 impact arms (Figure 48)
- 2 front deck-lift-cylinder pivots (Figure 48)
- 2 side deck-lift-cylinder pivots (Figure 48)
- 4 steering-cylinder-ball joints (Figure 49)
- 2 tie-rod-ball joints (Figure 49)
- 2 king-pin bushings (Figure 49)
- 1 rear axle-pivot bushing (Figure 50)
- 1 brake-shaft-pivot bearing (Figure 51)

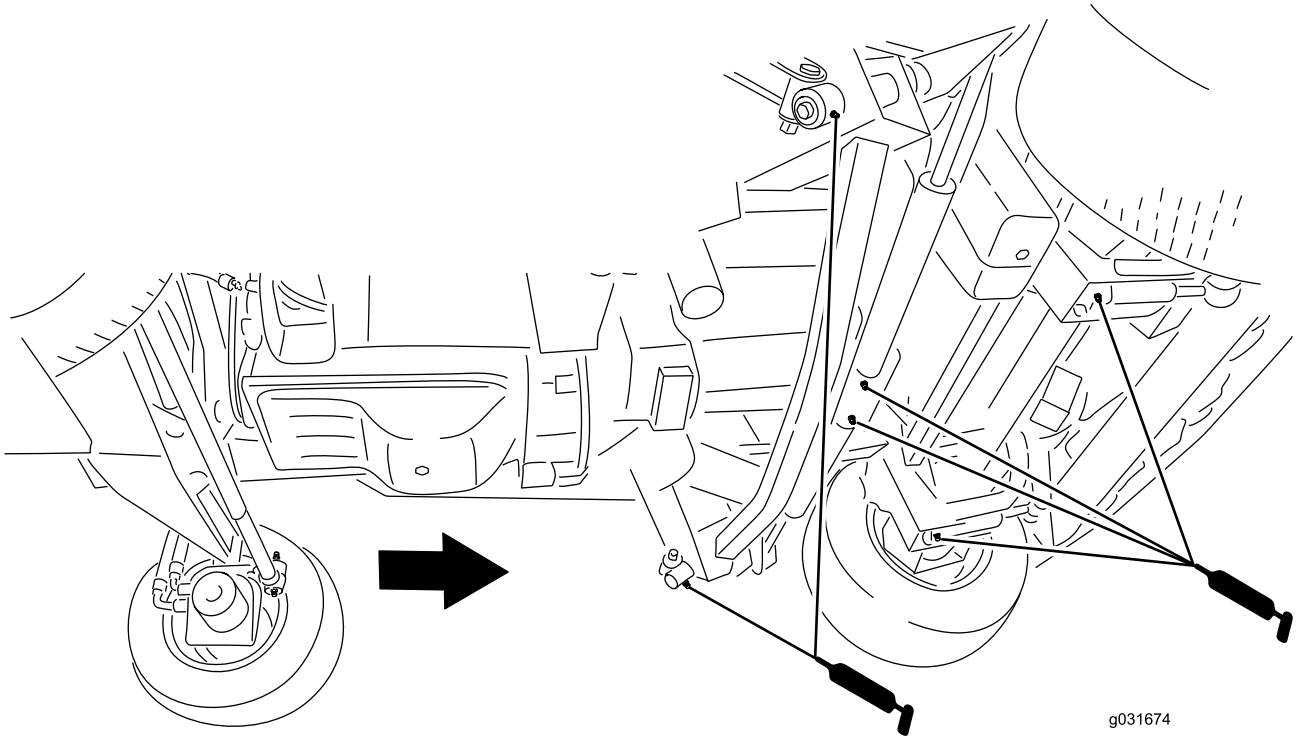


Figure 48

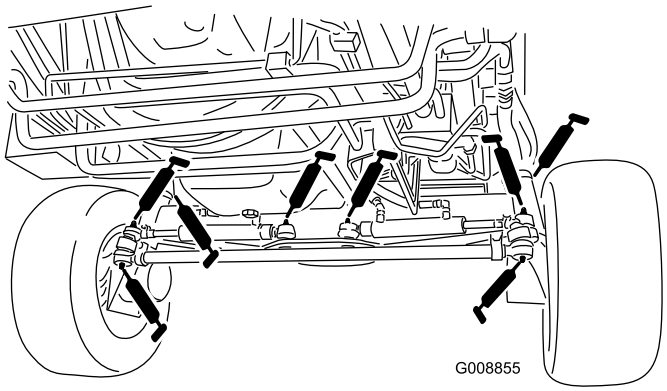


Figure 49

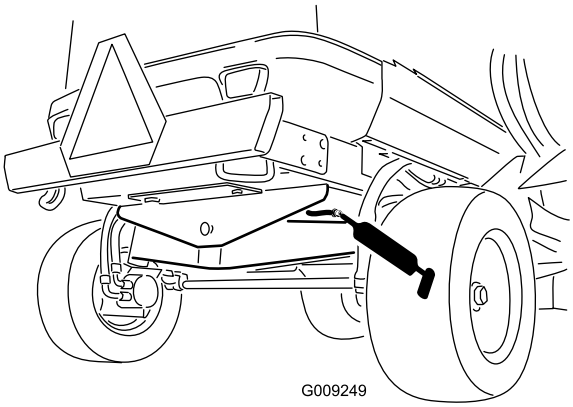


Figure 50

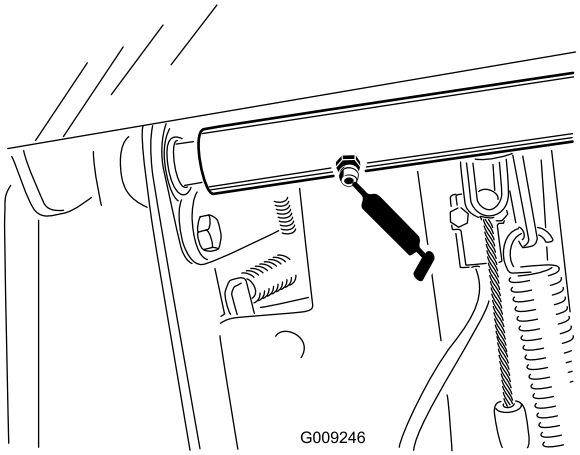


Figure 51

Front Mower Deck

- 2 caster-fork-shaft bushings (Figure 52)
- 5 spindle-shaft bearings (located on the spindle housing) as shown in Figure 52
- 3 idler-arm-pivot bushings (located on the idler-pivot shaft) as shown in Figure 52

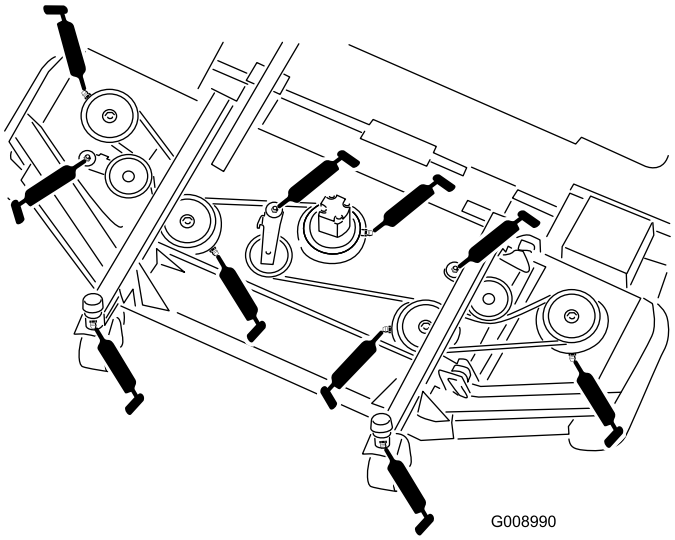


Figure 52

Front Lift Assemblies

- 2 lift-arm bushings (Figure 53)
- 2 lift-arm ball joints (Figure 53)
- 2 front deck-lift-cylinder pivots (Figure 53)

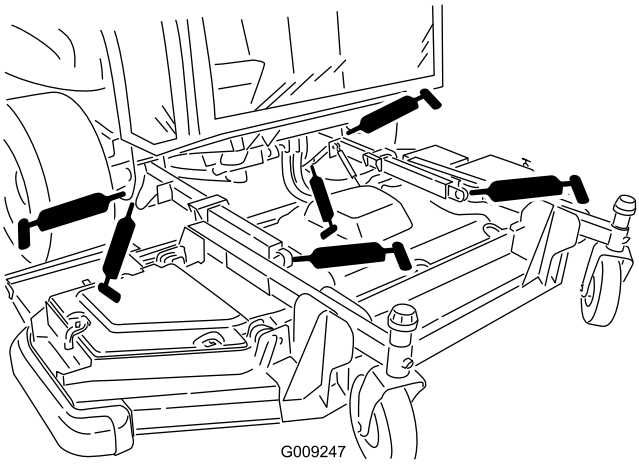


Figure 53

Side Mower Decks (Each Side)

- 4 caster-fork-shaft bushings (Figure 54)
- 3 spindle-shaft bearings (located on the spindle housing) as shown in Figure 54
- 2 idler-arm-pivot bushings (located on the idler-pivot shaft) as shown in Figure 54

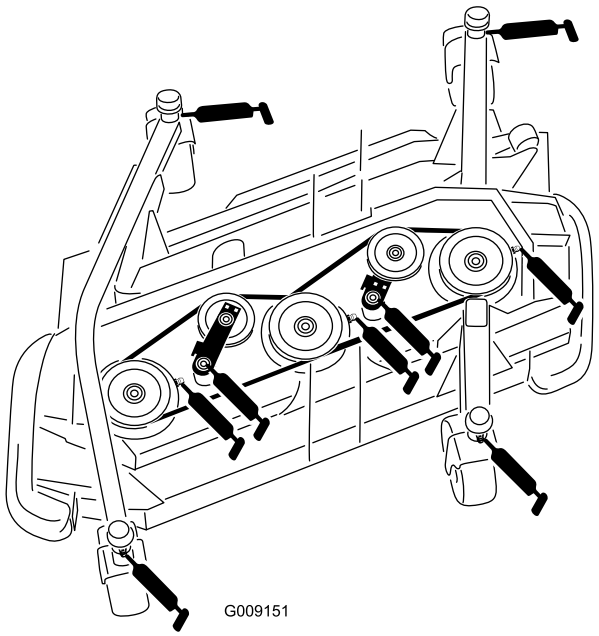


Figure 54

Side Lift Assemblies (Per Side)

- 3 main lift-arm bushings (Figure 55)
- 1 lift-cylinder bushing (Figure 55)

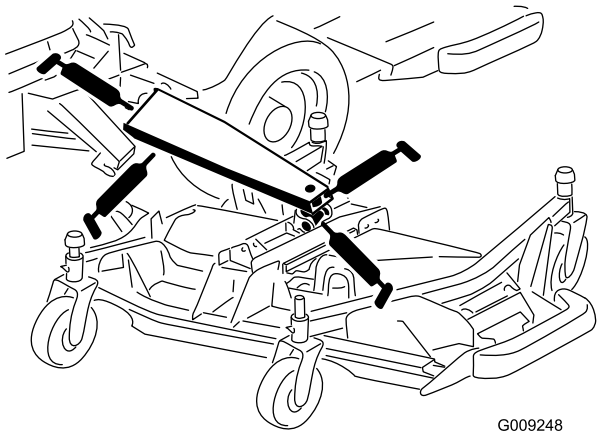


Figure 55

Engine Maintenance

Engine Safety

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

Air-Cleaner Maintenance

Check the air-cleaner body for damage that could cause an air leak and replace it if it is damaged. Check the entire intake system for leaks, damage, or loose hose clamps. Also, inspect the rubber intake-hose connections at the air cleaner and turbocharger to ensure that the connections are complete.

Service the air-cleaner filter only when the "Check Air Filter" message is displayed on the InfoCenter (Figure 56). Changing the air filter before it is necessary only increases the chance of dirt entering the engine when you remove the filter.

Ensure that the cover is seated correctly and seals with the air-cleaner body.

Figure 56

Servicing the Air-Cleaner Cover

Service Interval: Every 50 hours—Remove air cleaner cover and clean out debris Do not remove filter.

1. Pull the latch outward and rotate the air-cleaner cover counterclockwise (Figure 57).
2. Remove the cover from the air-cleaner body.
3. Clean any debris from the cover and install the cover. Do not remove the air filters

Servicing the Air-Cleaner Filter

1. Before removing the filter, use low pressure air 275 kPa (40 psi, clean and dry) to remove large accumulations of debris packed between outside of primary filter and the canister.

   Note: 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 you remove the primary filter.
2. Remove the primary filter (Figure 57).

   Note: Do not clean a used element due to the possibility of damage to the filter media.

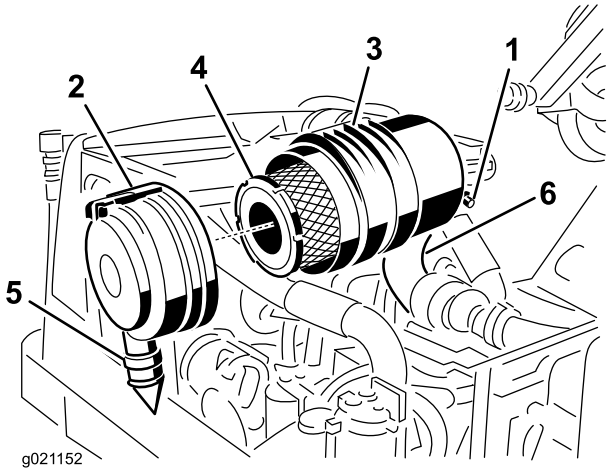


Figure 57

1. Air-cleaner restriction sending unit
2. Air-cleaner latch
3. Air-cleaner body
4. Air-cleaner primary filter
5. Rubber outlet valve
6. Rubber intake hose

Important: ***Do not*** **remove the safety filter. Never attempt to clean the safety filter (Figure 58). Replace the safety filter with a new one after every 3 primary filter services.**

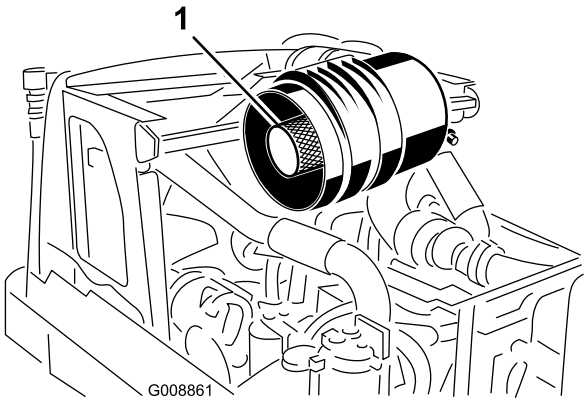


Figure 58

1. Safety filter

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

   Important: Do not use a damaged element.
4. Replace the primary filter (Figure 57).
5. Insert the new filter by applying pressure to the outer rim of the element to seat it in the canister.

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

6. Clean the dirt-ejection port located in the removable cover.
7. Remove the rubber outlet valve from the cover, clean the cavity, and replace the outlet valve.
8. Install the cover orienting the rubber outlet valve in a downward position - between approximately 5:00 to 7:00 when viewed from the end (Figure 57).
9. Secure the latch.

Servicing the Engine Oil

Checking the Engine-Oil Level

Service Interval: Before each use or daily—Check the engine-oil level.

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

The crankcase capacity is 8.04 L (8.5 US qt) with the filter.

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

- API Classification Level Required: CH-4, CI-4 or higher.
- Preferred oil: SAE 15W-40 (above 0°F)
- Alternate oil: SAE 10W-30 (below 23°F)

Toro Premium Engine Oil is available from your distributor in either 15W-40 or 10W-30 viscosity. See the parts catalog for part numbers. Also, refer to the engine owner's manual (included with the machine) for further recommendations.

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

1. Park the machine on a level surface.
2. Remove the dipstick, wipe it clean, install it into the tube, and pull it out again (Figure 59).

   Note: The oil level should be up to the Full mark.

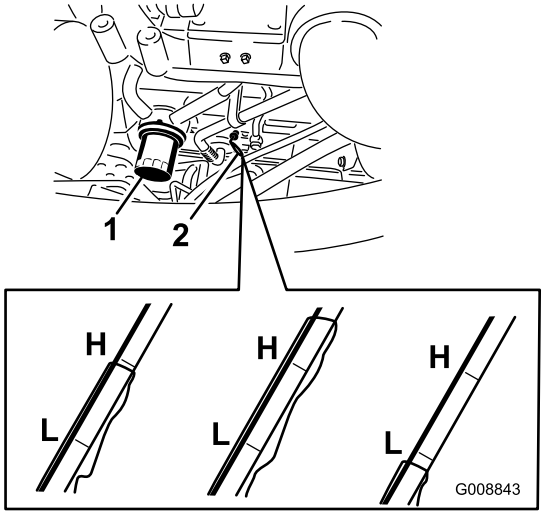


Figure 59

1. Oil filter
2. Dipstick

3. If the oil is below the Low mark, remove the oil-fill cap and add oil until the level reaches the Full mark (Figure 60).

   Important: **Do not overfill.**

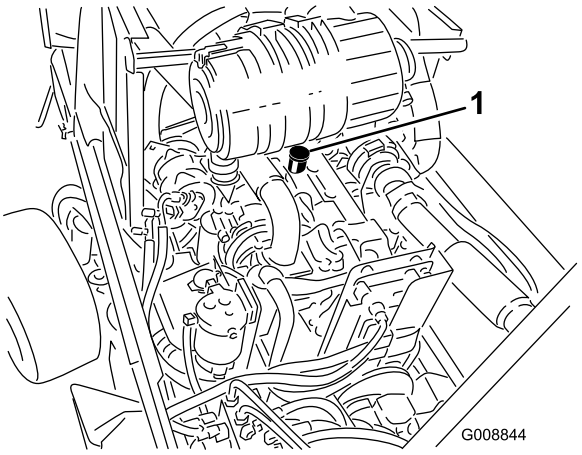


Figure 60

1. Oil-fill cap

4. Install the oil-fill cap and dipstick.

Changing the Engine Oil

Service Interval: Every 250 hours—Change the engine oil and filter.

1. Remove the drain plug and let the oil flow into a drain pan (Figure 61).

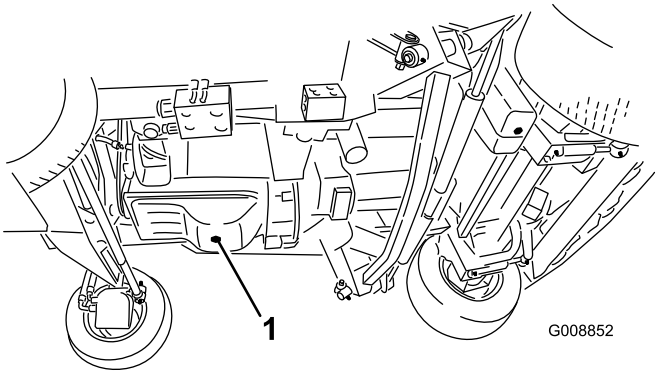


Figure 61

1. Engine-oil drain plug

2. When the oil stops draining, install the drain plug.
3. Remove the oil filter (Figure 59).
4. Apply a light coat of clean oil to the new filter seal before screwing it on.

   Important: Do not overtighten.

5. Add oil to the crankcase; refer to Checking the Engine-Oil Level (page 43).

Adjusting the Valve Clearance

Service Interval: After the first 250 hours—Adjust the valve clearance.

Every 2,000 hours—Adjust the valve clearance.

Refer to the engine owner's manual (included with the machine) for the adjustment procedure.

Fuel System Maintenance

Servicing the Fuel System

Draining the Fuel Tank

Service Interval: Every 1,000 hours—Drain and clean the fuel tank.

Drain and clean the tank if fuel system becomes contaminated or if you are storing the machine for an extended period of time. Use clean fuel to flush out the tank.

Inspecting the Fuel Lines and Connections

Service Interval: Every 500 hours—Inspect the fuel lines and connections.

Check the fuel lines and connections every 500 hours or yearly, whichever comes first. Inspect them for deterioration, damage, or loose connections.

Servicing the Water Separator

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

Every 500 hours—Replace the fuel/water separator element.

Draining the Water Separator

1. Place a clean container under the water separator (Figure 62).
2. Open the drain plug and operate the pump to drain contaminates (Figure 62).

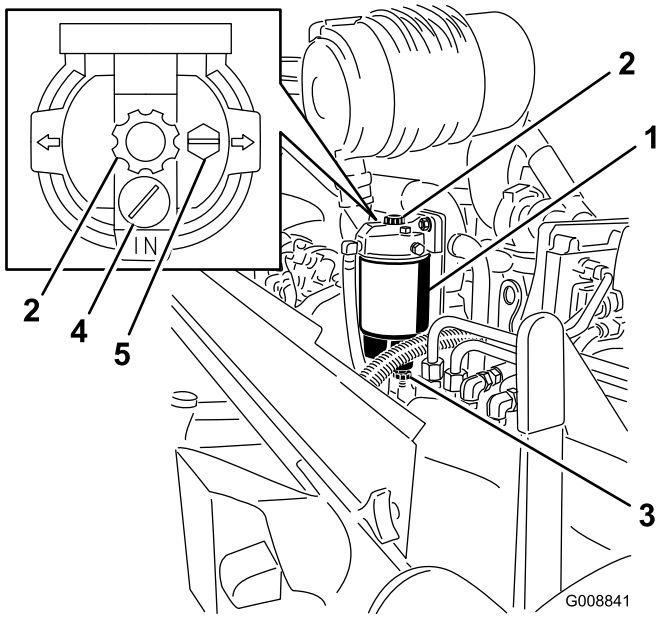


Figure 62

1. Water-separator-filter canister
2. Priming pump
3. Drain plug
4. Flow-check valve
5. Vent plug

3. Close the drain plug.

Replacing the Fuel-Filter Element

1. Place a clean container under the water separator.
2. Drain some fuel by loosening the vent plug and opening the drain plug (Figure 62).
3. Disconnect the water sensor (electrical connector) from the bottom of the water separator.
4. Clean the area where the filter element mounts to the head.
5. Remove the filter element and bowl.
6. Remove the element from the bowl and clean the mounting surface.
7. Clean the O-ring gland on the bowl.
8. Apply a coating of clean fuel or engine oil to the new O-ring and element seal.
9. Spin the bowl onto the new element, then spin them both onto the filter head by hand only.

   Note: Do not use tools.
10. Close the drain plug.
11. Connect the water sensor (electrical connector) from the bottom of the water separator.
12. With the vent plug still loosened, operate the primer pump until the fuel purges at the vent plug.
13. Close the vent plug, start the engine, and check for leaks.

    Note: Correct as necessary with the engine off.

Replacing the Fuel Filter

Service Interval: Every 500 hours—Replace the fuel-filter element

1. Clean the area around the fuel-filter head (Figure 63).

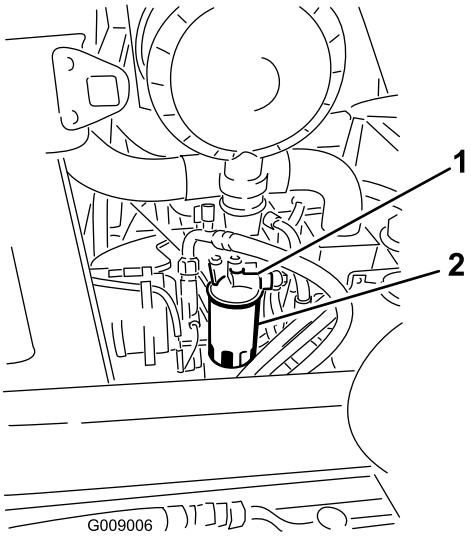


Figure 63

1. Fuel-filter head
2. Filter

2. Remove the filter and clean the filter-head-mounting surface (Figure 63).
3. Lubricate the filter gasket with clean, lubricating engine oil; refer to the engine owner's manual (included with the machine) for additional information.
4. Install the dry filter canister, by hand, until the gasket contacts the filter head, then rotate it an additional 1/2 turn.
5. Loosen the banjo fitting on the fuel-filter housing (Figure 64).

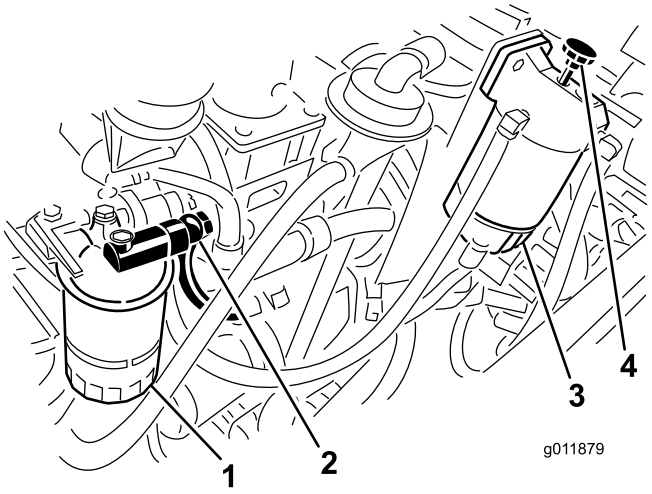


Figure 64

1. Fuel filter
2. Banjo fitting
3. Water Separator
4. Priming pump

6. Operate the water-separator priming pump until a solid stream of fuel is detected at the banjo fitting (Figure 64).
7. Tighten the fuel-filter banjo fitting.
8. Push down the priming pump and turn it clockwise to secure.
9. Start the engine and check for fuel leaks around the filter head.

Electrical System Maintenance

Electrical System Safety

- Disconnect the battery before repairing the machine. Disconnect the negative terminal first and the positive last. Connect the positive terminal first and the negative last.
- Battery acid is poisonous and can cause burns. Avoid contact with your skin, eyes, and clothing. Protect your face, eyes, and clothing when working with a battery.
- Battery gases can explode. Keep cigarettes, sparks, and flames away from the battery.
- Charge the batteries in an open, well-ventilated area, away from sparks and flames. Unplug the charger before connecting or disconnecting the battery. Wear protective clothing and use insulated tools.
- Do not use a pressure washer near any electronic components.

WARNING

CALIFORNIA
Proposition 65 Warning

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

Locating the Fuses

The traction-unit fuses (Figure 67) are located in the power-center console (Figure 66).

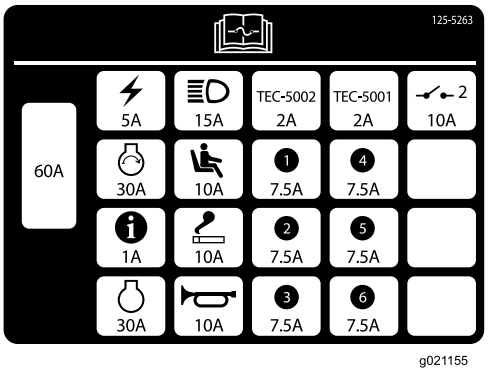


Figure 65

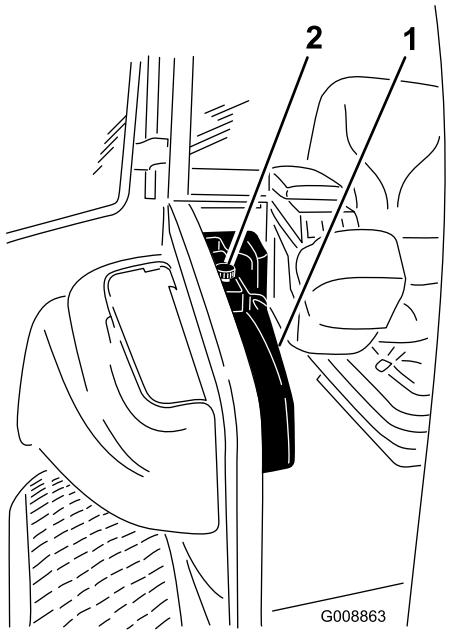


Figure 66

1. Power-center console
2. Knob

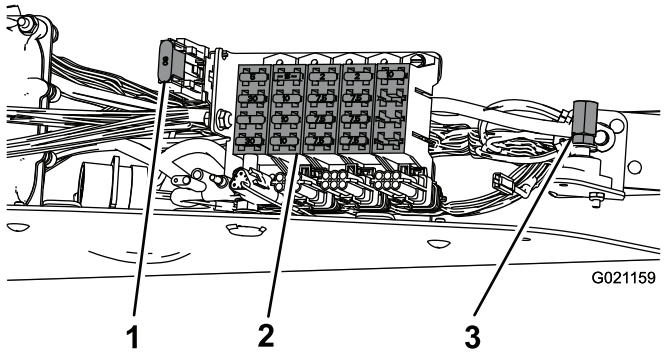


Figure 67

1. Fuse—60 A
2. Fuse block
3. Alternate positive post for charging or jump starting

The cab fuses (Figure 68) are located in the fuse box on the cab headliner (Figure 69).

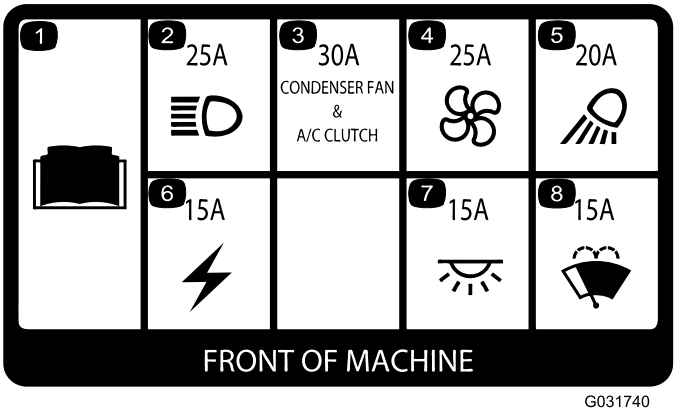


Figure 68

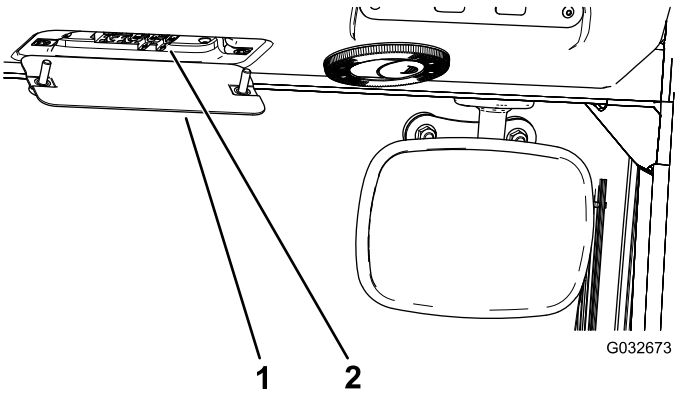


Figure 69

1. Cab fuse box
2. Fuses

Checking the Battery Condition

Service Interval: Every 50 hours—Check the condition of the battery.

Important: Before welding on the machine, disconnect the negative cable from the battery to prevent damage to the electrical system. Also, you must disconnect the engine, InfoCenter, and machine controllers before welding on the machine.

Note: Check the battery condition weekly or after every 50 hours of operation. Keep the terminals and the entire battery case clean, because a dirty battery discharges slowly. To clean the battery, wash the entire case with a solution of baking soda and water. Rinse with clear water. Coat the battery posts and cable connectors with Grafo 112X (skin-over) grease (Toro Part No. 505-47) or petroleum jelly to prevent corrosion.

Charging the Battery

⚠ WARNING

Charging the battery produces gasses that can explode.

Do not smoke near the battery, and keep sparks and flames away from the battery.

Important: Keep the battery fully charged. This is especially important to prevent battery damage when the temperature is below 32° F (0° C).

1. Perform the pre-maintenance procedure; refer to Preparing the Machine for Maintenance (page 38).
2. Clean the exterior of the battery case and the battery posts.

   Note: Connect the leads of the battery charger to battery posts before connecting the charger to the electrical source.
3. Look at the battery and identify the positive and negative battery posts.
4. Connect the positive lead of the battery charger to the positive battery post (Figure 70).

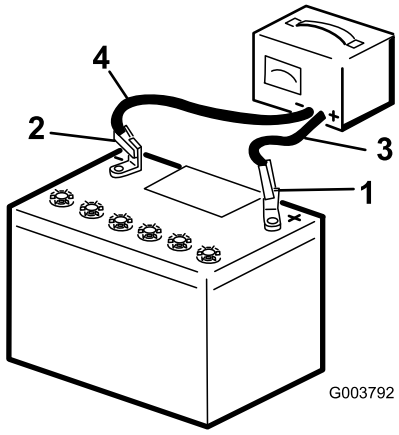


Figure 70

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

5. Connect the negative lead of the battery charger to the negative-battery post (Figure 70).
6. Connect the battery charger to the electrical source, and charge the battery according to the Battery-charging Table that follows.

   Important: Do not overcharge the battery.

Battery-charger Table

Charger setting	Charging time
4 to 6 amperes	30 minutes
25 to 30 amperes	10 to 15 minutes

7. When the battery is fully charged, unplug the charger from the electrical source, then disconnect the charger leads from the battery posts (Figure 70).

Using the Alternate Positive Post

If you need to jump start the machine or charge the batteries, you can use the alternate positive post instead of the positive battery post (Figure 67). The alternate positive post is located in the front of the power center console (Figure 66).

Calibrating the Traction Pedal

Service Interval: Every 1,000 hours—Calibrate the traction pedal.

Contact your local Toro distributor or refer to the *Toro Service Manual* for assistance.

Drive System Maintenance

Adjusting the Traction-Pedal Angle

You can adjust the operating angle of the traction pedal for your comfort.

1. Loosen the 2 nuts and bolts securing the left side of the traction pedal to the bracket (Figure 71).

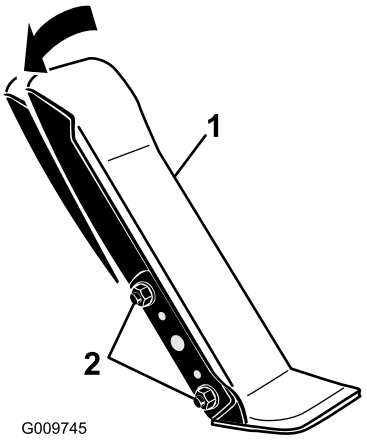


Figure 71

1. Traction pedal
2. Mounting nuts and bolts

2. Pivot the pedal to the desired operating angle and tighten the nuts (Figure 71).

Checking the Planetary-Drive Gear/Brake-Oil Level

Service Interval: Every 400 hours—Check the planetary-drive gear/brake-oil level (check if you observe external leakage).

Use high quality SAE 85W-140 gear lube as a replacement.

1. With the machine on a level surface, position the wheel so that 1 check plug is at the 12 o'clock position and the other is at the 3 o'clock position (Figure 72).

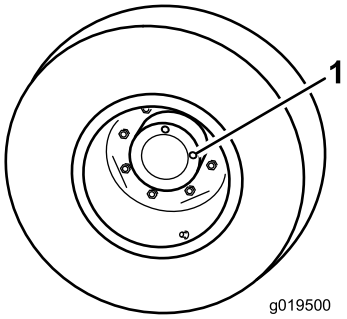


Figure 72

1. Check/drain plug (3 o'clock position)

2. Remove the plug at the 3 o'clock position (Figure 72).

   Note: The oil level should be within 6 mm (1/4 inch) of the check-plug hole.

3. If the oil level is low, remove the plug at the 12 o'clock position and add oil until it begins to flow out of the hole at the 3 o'clock position.
4. Install both plugs.
5. Repeat steps 1 through 3 on the opposite planetary-gear assembly.

Changing the Planetary-Drive Gear/Brake Oil

Service Interval: After the first 250 hours—Change the planetary-drive gear/brake oil.

Every 800 hours

Use a high quality SAE 85W-140 gear lube as replacement.

1. With machine on level surface, position a wheel so one of the check/drain plugs is at the lowest (6 o'clock) position (Figure 73).

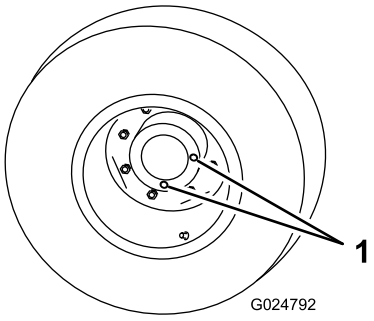


Figure 73

1. Check/drain plugs

2. Place a drain pan under the planetary hub, remove both plugs, and allow oil to drain.
3. Place a drain pan under the brake housing, remove the drain plug, and allow the oil to drain (Figure 74).

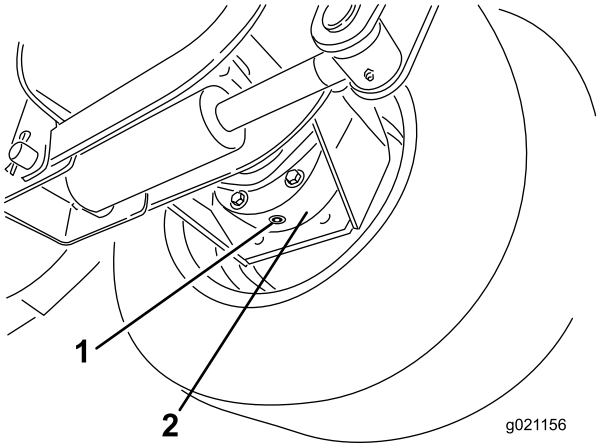


Figure 74

1. Drain plug
2. Brake housing

4. When all of the oil has drained from both locations, install the plug in the brake housing.
5. Rotate the wheel until the open holes in the planetary are at the 11 o'clock and 1 o'clock positions.

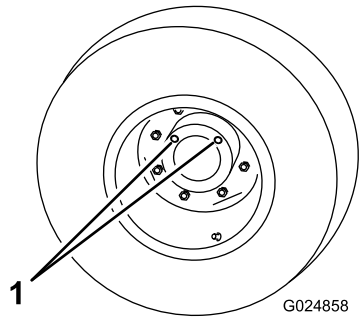


Figure 75

1. Holes at the 11 o'clock and 1 o'clock positions

6. Through either open hole, slowly fill the planetary with 0.53 to 0.59 L (18 to 20 ounces) of high quality SAE 85W-140 wt. gear lube.
7. Install the plugs.
8. Repeat the procedure on the opposite planetary/brake assembly

Checking the Rear-Wheel Toe-in

Service Interval: Every 1,000 hours—Check the rear-wheel toe-in.

1. Measure the center-to-center distance (at axle height) at the front and rear of the steering tires (Figure 76).

   Note: The front measurement cannot be more than 3 mm (0.12 inch) less than the rear measurement.

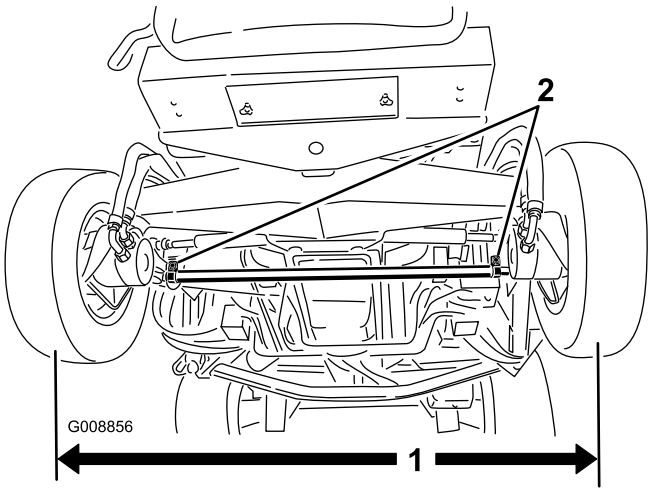


Figure 76

1. Center-to-center distance
2. Tie-rod clamps

2. To adjust, loosen the clamps at both ends of the tie rods (Figure 76).
3. Rotate the tie-rod end to move the front of the tire inward or outward.
4. Tighten the tie-rod clamps when the adjustment is correct.

Cooling System Maintenance

Cooling System Safety

⚠ CAUTION

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

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

⚠ DANGER

Swallowing engine coolant can cause poisoning.

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

Checking the Cooling System

Service Interval: Before each use or daily—Check the coolant level.

Check level of coolant at the beginning of each day. The capacity of the system on a machine without a cab is 10.4 L (13.5 qt) and with a cab is 17 L (18 qt).

Recommended Coolant

Note: Coolant must meet or exceed ASTM Standard 3306

Glycol based pre-diluted coolant (50/50 blend)

or

Glycol based coolant mixed with **distilled** water (50/50 blend)

or

Glycol based coolant mixed with good quality water (50/50 blend) as listed in the Cummins Manual

$CaCO_3$ + $MgCO_3$ <170 ppm

Chloride <40 ppm (Cl)

Sulfer <100 ppm (SO_4)

⚠ DANGER

The rotating fans and drive belts can cause personal injury.

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

⚠ CAUTION

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

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

1. Carefully remove the radiator cap and expansion tank cap (Figure 77).

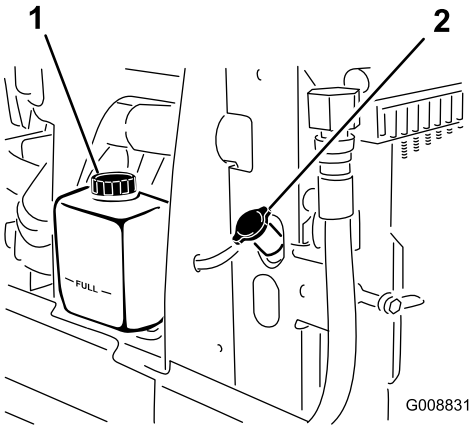


Figure 77

1. Expansion tank 2. Radiator cap

2. Check the coolant level in the radiator.

   Note: The radiator should be filled to the top of the filler neck and the expansion tank filled to the Full mark.

3. If the coolant is low, add recommended replacement coolant, as required.

   Note: Do not use water only or alcohol/methanol-based coolants.

4. Install the radiator cap and expansion-tank cap.

Servicing the Engine-Cooling System

Service Interval: Every 100 hours—Inspect the cooling-system hoses.

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

Before each use or daily (more often in dusty or dirty conditions).

1. Shut off the engine and raise the hood.
2. Clean the engine area thoroughly of all debris.
3. Rotate the latches securing the oil cooler to the frame (Figure 78).

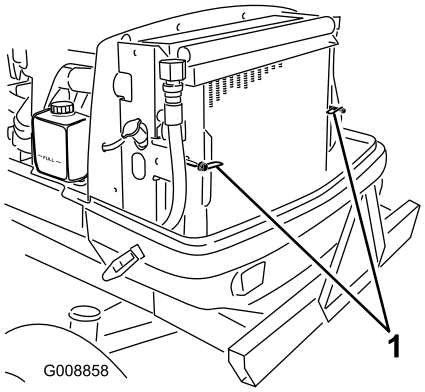


Figure 78

1. Latches

4. Pivot the oil cooler rearward.
5. Clean both sides of the oil cooler and radiator area thoroughly with compressed air.

   Note: Start from the fan side and blow the debris out towards the back. Then clean from the back side and blow towards the front. Repeat procedure several times until all chaff and debris is removed.

   Important: Cleaning the radiator or oil cooler with water can promote premature corrosion and damage to components.
6. Pivot the oil cooler back into position.
7. Secure the oil cooler to the frame with the latches and close the hood.

Brake Maintenance

Adjusting the Service Brakes

Adjust the service brakes when there is more than 50 mm (2 inches) 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.

1. Disengage the locking latch from the brake pedals so that both pedals work independently of each other.
2. To reduce the free travel of the brake pedals, adjust the brake cables as follows:

   A. Loosen the front nut on the threaded end of the brake cable.

   Note: For easier access to the adjusting nuts, you may unhook and remove the spring.

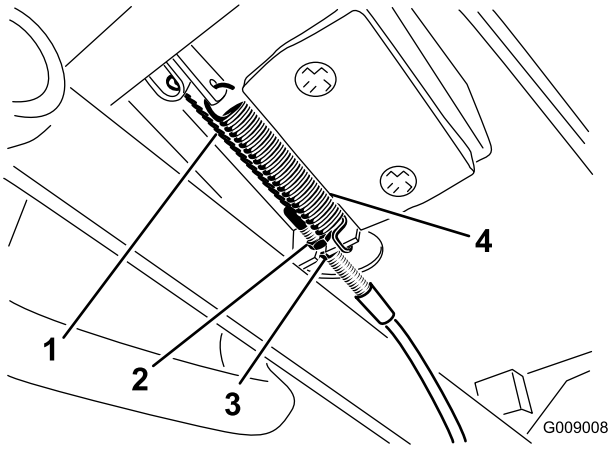


Figure 79

1. Brake cable
2. Front nut
3. Rear nut
4. Spring

   B. Tighten the rear nut until the brake pedals have 50 mm (2 inches) of free travel.

   C. Repeat the procedure on the other brake cable.

   D. Tighten the front nuts after adjusting the brakes.

   E. Install the springs, if removed.

Important: Adjusting the brake tension too tight decreases the life of the friction-pad material.

Belt Maintenance

Servicing the Alternator Belt

Service Interval: After the first 10 hours—Check the alternator-belt tension.

Every 1,000 hours—Check the alternator-belt tension.

Refer to the engine owner's manual (included with the machine) for the servicing procedure.

Servicing the Compressor Belt

Model 31599 Only

Service Interval: After the first 10 hours—Check the compressor-belt tension.

Every 1,000 hours—Check the compressor-belt tension.

1. Loosen the compressor-pivot bolt and adjusting bolt (Figure 80).
2. Insert a torque wrench into the square hole in the compressor bracket (Figure 80).

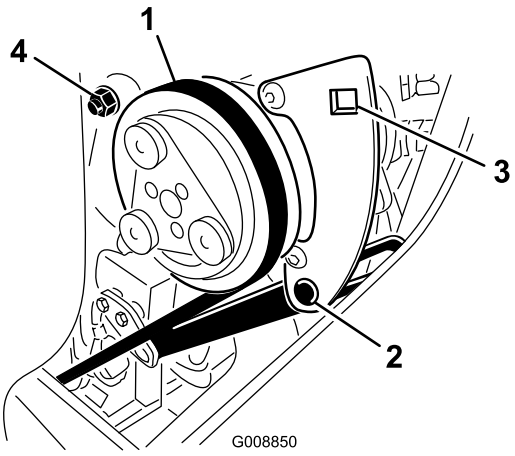


Figure 80

1. Compressor belt
2. Mounting bolt
3. Square hole
4. Pivot bolt

3. Rotate the wrench until you attain a torque of 37 to 45 N·m (27 to 33 ft-lb).
4. Tighten the mounting bolts.

Replacing the Blade-Drive Belts

Service Interval: Every 50 hours—Inspect the blade-drive belts.

Every 1,000 hours—Replace the blade-drive belts.

The blade-drive belt, tensioned by the spring-loaded idler pulley, is very durable. However, after many hours of use, the belt will show signs of wear. Signs of a worn belt are squealing when the belt is rotating; blades slipping when cutting grass; frayed edges; burn marks; and cracks. Replace the belt if any of these signs occur.

Replacing the Front Mower-Deck Belt

1. Lower the mower deck to the shop floor.
2. Remove the belt covers from the top of the mower deck and set the covers aside.
3. On the front deck, loosen the jam nuts on the idler pulley stop screw and thread the stop screw into the bracket (Figure 81).

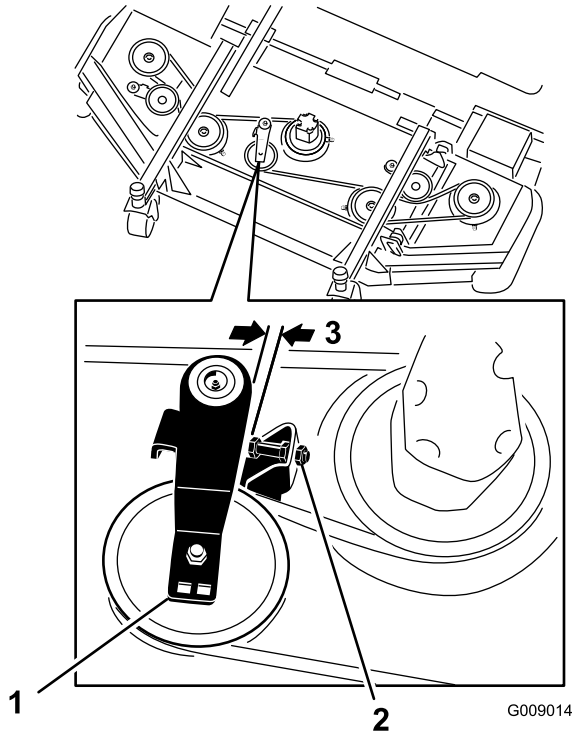


Figure 81

1. Idler stop screw
2. Idler pulley
3. 2.5 mm to 4 mm (0.10 to 0.16 inch)

4. Using a ratchet wrench or similar tool, move the idler pulley away from the drive belt to release the belt tension and allow the belt to be slipped off the deck pulleys (Figure 81).
5. Remove the bolts securing the hydraulic motor to the mower deck (Figure 82).

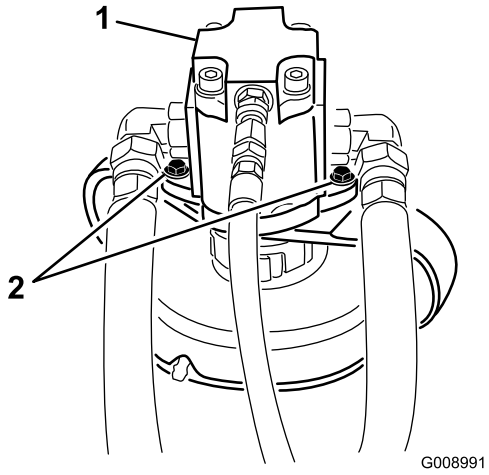


Figure 82

1. Hydraulic motor
2. Mounting bolts

6. Lift the motor off the mower deck and lay it on top of the mower deck.
7. Remove the old belt from around the spindle pulleys and idler pulley.
8. Route the new belt around the spindle pulleys and idler-pulley assembly (Figure 83).

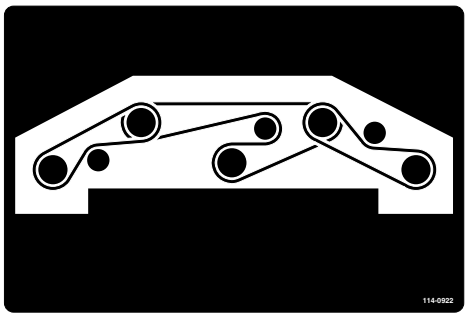


Figure 83

9. Adjust the stop screw on the idler pulley and tighten the jam nuts.

Replacing the Side Mower-Deck Belts

Note: To remove the lower belt, you must remove the upper belt first.

1. Lower the mower deck to the floor.
2. Remove the belt covers from the top of the mower deck and set the covers aside.
3. Remove the bolts securing the hydraulic motor to the mower deck (Figure 82).
4. Lift the motor off the mower deck and lay it on top of the mower deck.
5. Using a ratchet wrench or similar tool, move the idler pulleys away from the drive belt to release the belt tension and allow the belt to slip off the pulleys (Figure 84).

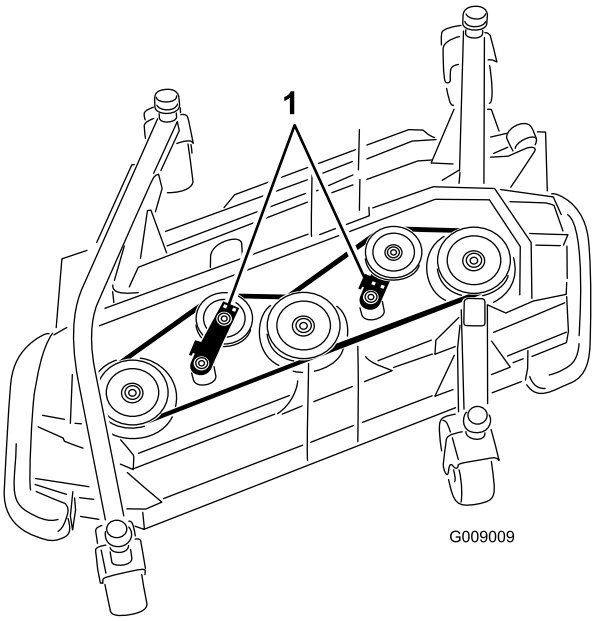


Figure 84

1. Idler pulleys

6. Remove the old belt from around the spindle pulleys and idler pulley.
7. Route the new belt around the spindle pulleys and idler-pulley assembly (Figure 85 and Figure 86).

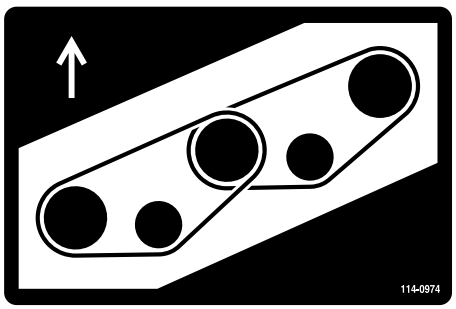


Figure 85
Right deck

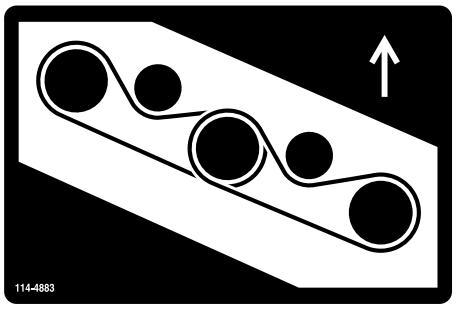


Figure 86
Left deck

Hydraulic System Maintenance

Hydraulic System Safety

⚠ WARNING

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

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

Checking the Hydraulic Fluid

Service Interval: Before each use or daily—Check the hydraulic fluid level.

The machines reservoir is filled at the factory with approximately 71.9 L (19 U.S. gallons) of high quality hydraulic fluid. **Check the level of the hydraulic fluid before the engine is first started and daily thereafter.**

Use **Toro Premium All Season Hydraulic Fluid** (Available in 5 gallon pails or 55 gallon drums. See the *Parts Catalog* or Toro distributor for part numbers.)

If the Toro fluid is not available, other fluids may be used provided they meet all the following material properties and industry specifications. Consult with your lubricant distributor to identify a satisfactory product.

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

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

Material Properties:	
Viscosity, ASTM D445	St @ 40° C 44 to 48
	St @ 100° C 7.9 to 8.5
Viscosity Index ASTM D2270	140 to 160
Pour Point, ASTM D97	-34° F to -49° F
FZG, Fail stage	11 or better
Water content (new fluid)	500 ppm (maximum)
Industry Specifications:	Vickers I-286-S (Quality Level), Vickers M-2950-S (Quality Level), Denison HF-0

High Viscosity Index/Low Pour Point Anti-wear Hydraulic Fluid, ISO VG 46 (cont'd.)

Important: The ISO VG 46 Multigrade fluid has been found to offer optimal performance in a wide range of temperature conditions. For operation in consistently high ambient temperatures, 18°C (65°F) to 49°C (120°F), ISO VG 68 hydraulic fluid may offer improved performance.

Premium Biodegradable Hydraulic Fluid-Mobil EAL EnviroSyn 46H

Important: Mobil EAL EnviroSyn 46H is the only synthetic biodegradable fluid approved by Toro. This fluid is compatible with the elastomers used in Toro hydraulic systems and is suitable for a wide-range of temperature conditions. This fluid is compatible with conventional mineral oils, but for maximum biodegradability and performance, the hydraulic system should be thoroughly flushed of conventional fluid. The oil is available in 5 gallon containers or 55 gallon drums from your Mobil Distributor.

Important: Many hydraulic fluids are almost colorless, making it difficult to spot leaks. A red dye additive for the hydraulic-system oil is available in 20 ml (2/3 oz) bottles. 1 bottle is sufficient for 15 to 22 L (4 to 6 gallons) of hydraulic oil. Order Toro Part No. 44-2500 from your authorized Toro distributor.

1. Perform the premaintenance procedure; refer to Preparing the Machine for Maintenance (page 38).
2. On the right side of the machine, raise the access cover to expose the hydraulic-tank cap (Figure 87).

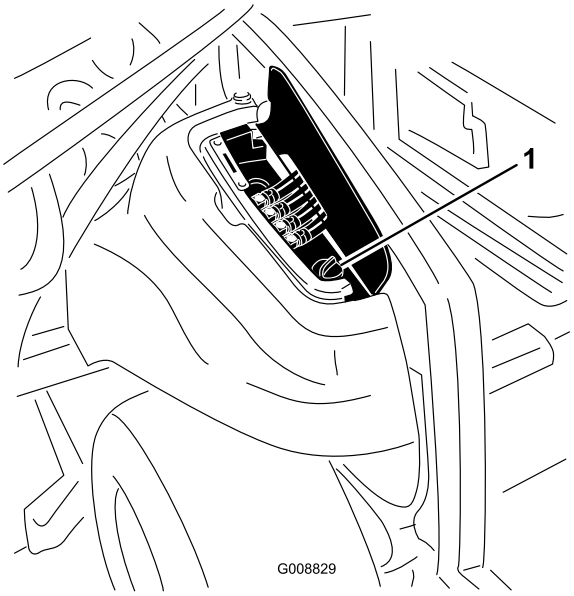


Figure 87

1. Hydraulic tank cap

3. Clean the area around the filler neck and cap of the hydraulic tank (Figure 87).
4. Remove the cap from the filler neck.
5. Remove the dipstick from the filler neck and wipe it with a clean rag. Insert the dipstick into the filler neck, then remove it and check the fluid level (Figure 88).

   Note: The fluid level should be within the safe-operating range on the dipstick

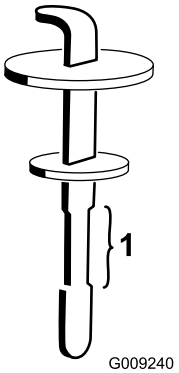


Figure 88

1. Safe-operating range

6. If the level is low, add the appropriate fluid to raise the level to the upper mark.
7. Install the dipstick and cap onto the filler neck.
8. Close the cover.

Changing the Hydraulic Fluid and Filters

Service Interval: Every 1,000 hours—Change the hydraulic fluid and filters.

If the fluid becomes contaminated, contact your local Toro distributor because the system must be flushed. Contaminated fluid looks milky or black when compared to clean oil.

Use Toro replacement filters (Part No. 86–6110 for the left side of the machine and 75-1310 for the right side of the machine).

Important: Use of any other filter may void the warranty on some components.

1. Position the machine on a level surface, lower the mower decks, shut off the engine, engage the parking brakes, and remove the ignition key.
2. Place a large drain pan under the hydraulic fluid tank.
3. Remove the drain plug (Figure 89) from the bottom of the tank and let the hydraulic fluid flow into the pan. Install the drain plug when the hydraulic fluid stops draining.

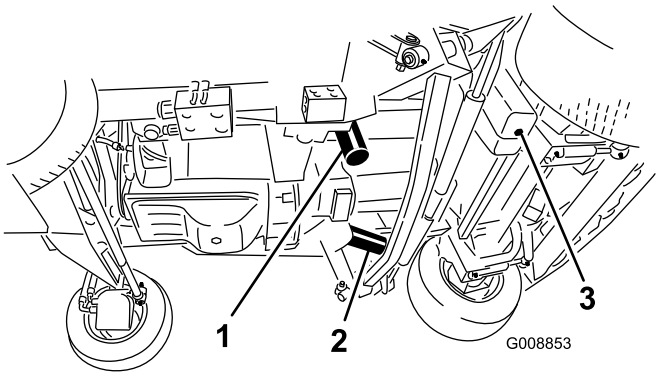


Figure 89

1. Hydraulic filter
2. Hydraulic filter
3. Hydraulic tank drain plug

4. Clean the area around the filter mounting areas.
5. Place a drain pan under the filter and remove the filter (Figure 89).
6. Lubricate the new filter gasket and fill the filter with hydraulic fluid.
7. Ensure that the filter-mounting area is clean. Screw the filters on until the gaskets contacts the mounting plates, then tighten the filter an additional 1/2 turn.
8. Fill the reservoir with hydraulic fluid; refer to Checking the Hydraulic Fluid (page 55).

   Important: Use only the hydraulic fluids specified. Other fluids could cause system damage.
9. Install the reservoir cap.

10. Start the engine and use all of the hydraulic controls to distribute hydraulic fluid throughout the system. Check for leaks, then shut off the engine.
11. Check the fluid level and add enough to raise level the level to the Full mark on the dipstick.

    Important: Do not overfill.

Checking the Hydraulic Lines and Hoses

Service Interval: Every 2 years—Replace moving hoses.

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

Inspecting the Hydraulic-System Test Ports

The test ports are used to test the pressure in the hydraulic circuits. Contact your local Toro distributor or refer to the *Toro Service Manual* for assistance.

Mower Maintenance

Pivoting (Tilting) the Front Mower Deck Upright

Note: Although not needed for normal maintenance procedures, you can pivot (tilt) the front mower deck upright.

1. Raise the front mower deck slightly off the floor.
2. Perform the premaintenance procedure; refer to Preparing the Machine for Maintenance (page 38).
3. Remove the retainer clip and disconnect the damper assembly from the mower deck (Figure 90).

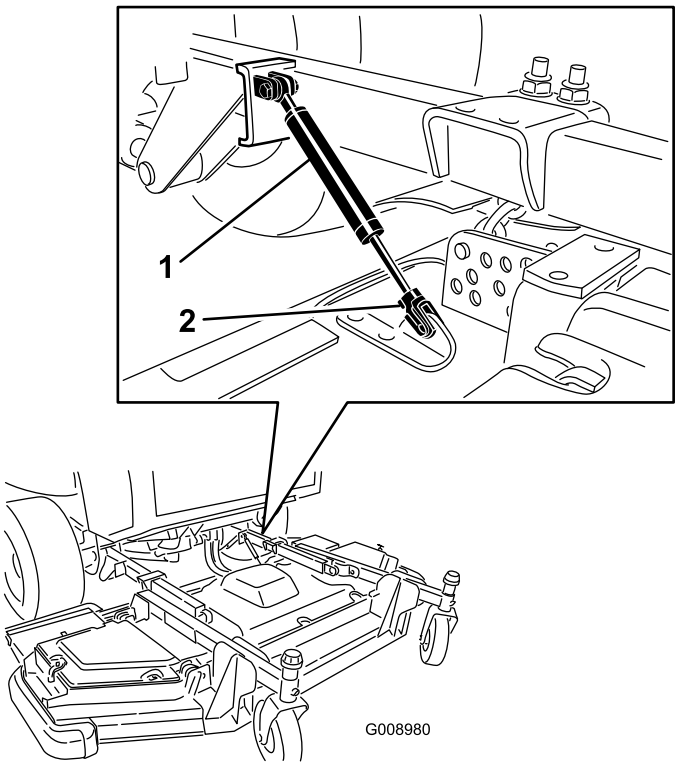


Figure 90

1. Damper assembly
2. Retainer clip

4. Remove the hairpin cotter and clevis pin securing the height-of-cut chains to the rear of the mower deck (Figure 91).

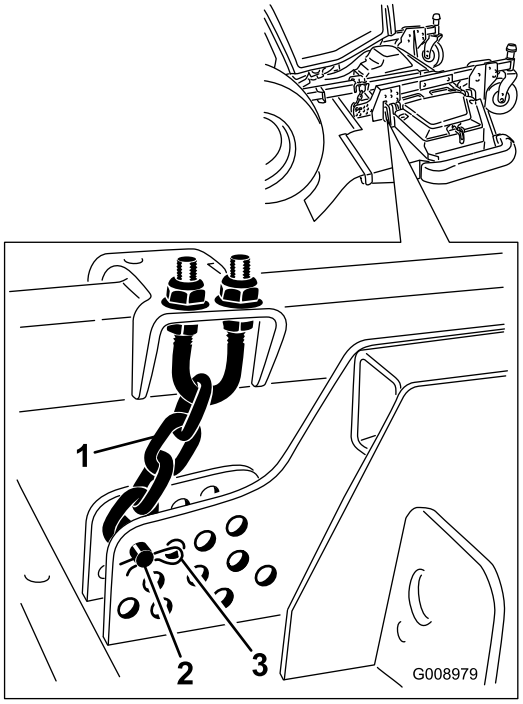


Figure 91

1. Height-of-cut chain
2. Clevis pin
3. Hairpin cotter

5. Start the engine, slowly raise the front mower deck, shut off the engine, and remove the ignition key.
6. Wedge a block of wood between the rear of the deck and the machine (Figure 92).

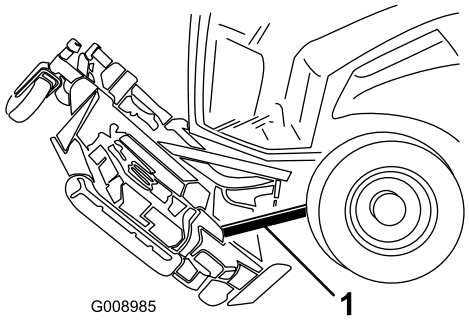


Figure 92

1. Block of wood

Pivoting (Tilting) the Front Mower Deck Down

1. With the help of another person holding the front of the mower deck, remove the block of wood.
2. Sit on the seat, start the engine, and lower the mower deck until it is slightly off the floor.
3. Secure the height-of-cut chains to the rear of the mower deck.
4. Connect the damper assembly and secure it with the retainer clip.

Adjusting the Mower-Deck Pitch

Measuring the Mower-Deck Pitch

The mower-deck pitch is the difference between the height-of-cut from the front of the blade plane to that of the back of the blade plane. Set a blade pitch of 7.5 mm (0.3 inch); i.e., the back of the blade plane should be 7.5 mm (0.3 inch) higher than the front of the blade plane.

1. Position the machine on a level surface on the floor.
2. Set the mower deck to the desired height of cut.
3. Ensure that the winglets are level to the front deck and the front deck is level side to side.

Adjusting the Front-Mower-Deck Pitch

1. Rotate the 2 outer, front blades and the winglet blades, so that they point straight forward (Figure 93).

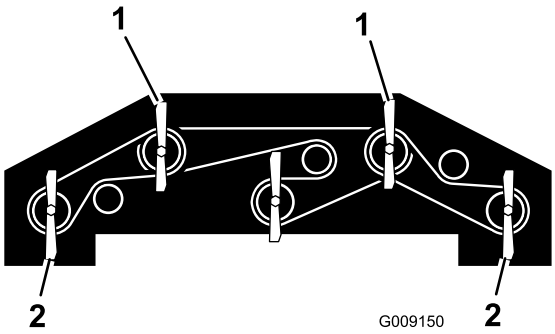


Figure 93

1. Use 1 of these blades for measuring the front-blade height.
2. Use 1 of these blades for measuring the rear-blade height.

2. Using a short ruler, measure from the floor to the front tip of the front blade and record this dimension.
3. Measure from the floor to the back tip of the winglet blade and record this dimension.
4. Subtract the front dimension from the rear dimension to calculate the blade pitch.
5. Loosen the jam nuts on the top or bottom of the height-of-cut chain U-bolt (Figure 94).

   Note: Loosen or tighten the height-of-cut chain nuts equally so that the deck remains level from side to side.

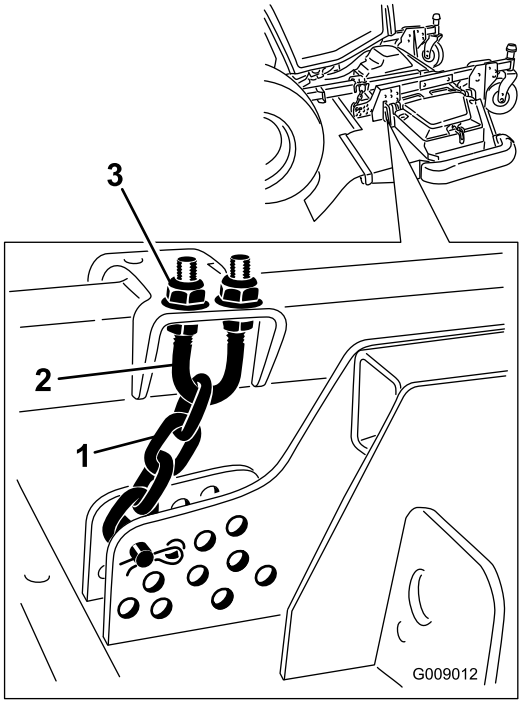


Figure 94

1. Height-of-cut chain
2. U-bolt
3. Nut (2)

6. Adjust the other set of nuts to raise or lower the rear of the mower deck and attain the correct mower-deck pitch.
7. Tighten the jam nuts.

Adjusting the Side-Mower-Deck Pitch

1. Remove the tensioning cap from the caster-spindle shaft and slide the spindle out of the caster arm (Figure 95).

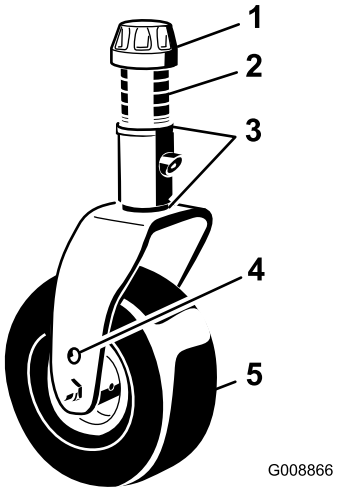


Figure 95

1. Tensioning cap
2. Spacers
3. Shims
4. Top axle-mounting hole
5. Caster wheel

2. Position the shims, as required, to raise or lower the castor wheel until the mower deck has the correct pitch.
3. Install the tensioning cap.

Servicing the Castor-Arm Bushings

The caster arms have bushings pressed into the top and bottom of the tube, and after many hours of operation, the bushings wear. To check the bushings, move the caster fork back and forth and from side to side. If the caster spindle is loose inside the bushings, the bushings are worn and must be replaced.

1. Raise the mower deck so that the wheels are off the floor. Block the mower deck so that it cannot accidentally fall.
2. Remove the tensioning cap, spacer(s), and thrust washer from the top of the castor spindle.

   Note: Record the position of the washers and spacers before removal so the deck pitch does not have to be adjusted.
3. Pull the castor spindle out of the mounting tube. Allow the thrust washer and spacer(s) to remain on the bottom of the spindle.
4. Insert a pin punch into the top or bottom of the mounting tube and drive the bushing out of the tube (Figure 96).

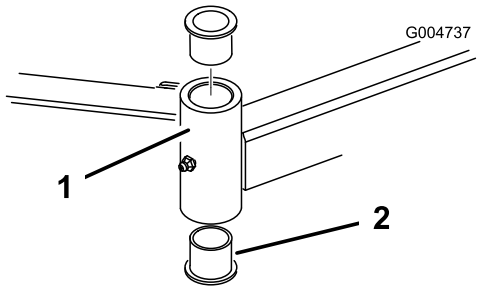


Figure 96

1. Castor arm tube
2. Bushings

5. Drive the other bushing out of the tube.
6. Clean the inside of the tubes to remove dirt.
7. Apply grease to the inside and outside of the new bushings.
8. Using a hammer and flat plate, drive the bushings into the mounting tube.
9. Inspect the castor spindle for wear and replace it if it is damaged.
10. Push the castor spindle through the bushings and mounting tube. Slide the thrust washer and spacer(s) onto the spindle.
11. Install the tensioning cap on the castor spindle to retain all parts in place.

Servicing the Caster Wheels and Bearings

Service Interval: Every 500 hours—Inspect the mower-deck caster-wheel assemblies.

1. Remove the locknut from the bolt holding the caster-wheel assembly between the caster fork or the caster-pivot arm (Figure 97).

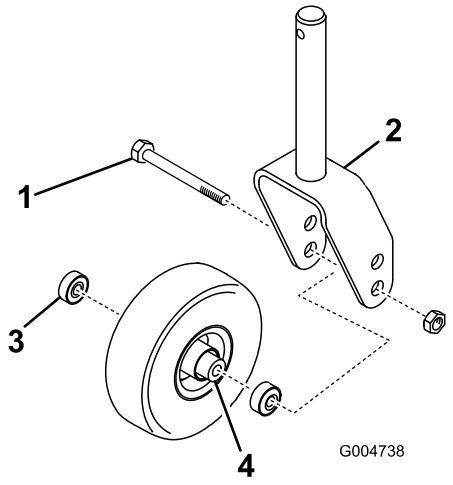


Figure 97

1. Caster wheel
2. Caster fork
3. Bearing
4. Bearing spacer

2. Grasp the caster wheel and slide the bolt out of the fork or pivot arm (Figure 97).
3. Remove the bearing from the wheel hub and allow the bearing spacer to fall out (Figure 97).
4. Remove the bearing from the opposite side of the wheel hub (Figure 97).
5. Check the bearings, spacer, and inside of the wheel hub for wear.

   Note: Replace any damaged parts.
6. To assemble the caster wheel, push the bearing into the wheel hub.

   Note: When installing the bearings, press on the outer race of the bearing.
7. Slide the bearing spacer into the wheel hub and push the other bearing into the open end of the wheel hub to captivate the bearing spacer inside the wheel hub.
8. Install the caster-wheel assembly between the caster fork and secure it in place with the bolt and locknut.

Blade Maintenance

Blade Safety

⚠ DANGER

A worn or damaged blade can break, and a piece of the blade could be thrown at you or bystanders, resulting in serious personal injury or death. Trying to repair a damaged blade may result in discontinued safety certification of the product.

- **Inspect the blade periodically for wear or damage.**
- **Never try to straighten a blade that is bent or weld a broken or cracked blade.**
- **Replace a worn or damaged blade.**
- Use care when checking the blades. Wrap the blades or wear gloves, and use caution when servicing the blades. Only replace the blades; never straighten or weld them.
- On multi-bladed machines, take care as rotating 1 blade can cause other blades to rotate.

Checking for a Bent Blade

After striking a foreign object, inspect the machine for damage and make repairs before restarting and operating the equipment. Torque all the spindle-pulley nuts to 176 to 203 N·m (130 to 150 ft-lb).

1. Position the machine on a level surface.
2. Raise the mower deck, engage the parking brake, put the traction pedal in NEUTRAL, make sure that the PTO switch is in the OFF position, shut off the engine, and remove the ignition key.
3. Block the mower deck to prevent it from accidentally falling.
4. Rotate the blade until the ends face forward and backward, and measure from the inside of the mower deck to the cutting edge at the front of the blade (Figure 98).

   Note: Record this dimension.

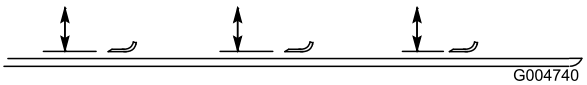


Figure 98

5. Rotate the opposite end of the blade forward and measure between the mower deck and cutting edge of the blade at the same position as in step 4.

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

blade is bent and must be replaced; refer to Removing and Installing a Blade (page 61).

Removing and Installing a Blade

Replace the blade if it hits a solid object, if it is out of balance, or if it is bent. Always use genuine Toro replacement blades to be sure of safety and optimum performance. Never use replacement blades made by other manufacturers because they could be dangerous.

1. Raise the mower deck to the highest position.
2. Perform the premaintenance procedure; refer to Preparing the Machine for Maintenance (page 38).
3. Block the mower deck to prevent it from accidentally falling.
4. Grasp the end of the blade using a rag or thickly padded glove and remove the blade bolt, anti-scalp cup, and blade from the spindle shaft (Figure 99).

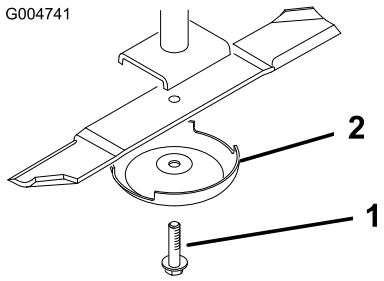


Figure 99

1. Blade bolt
2. Anti-scalp cup

5. Install the blade, anti-scalp cup, and blade bolt.
6. Torque the blade bolt to 115 to 149 N·m (85 to 110 ft-lb).

Important: The curved part of the blade must point toward the inside of the mower deck to ensure proper cutting.

Note: After striking a foreign object, torque all the spindle-pulley nuts to 176 to 203 N·m (130 to 150 ft-lb) and the blade bolts to 115 to 149 N·m (85 to 110 ft-lb).

Inspecting and Sharpening the Cutter Blade(s)

Service Interval: After the first 10 hours

Every 50 hours

Before each use or daily

You must consider 2 areas of the blade when checking and servicing it: the sail and the cutting edge. Both cutting edges and the sail, which is the turned-up portion opposite of the cutting edge, contribute to a good quality of cut. The sail is important because it lifts the grass up straight, thereby producing an even cut. However, the sail gradually wears down during operation, which is normal. As the sail wears down, the quality of cut degrades somewhat, although the cutting edges are sharp. The cutting edge of the blade must be sharp so that the grass is cut, not torn. A dull cutting edge is evident when the tips of the grass appear brown and shredded. Sharpen the cutting edges to correct this condition.

1. Position the machine on a level surface, raise the mower deck, engage the parking brake, put the traction pedal in NEUTRAL, ensure that the PTO switch is in the OFF position, shut off the engine, and remove the ignition key.
2. Examine the cutting ends of the blade carefully (especially where the flat and curved parts of the blade meet) as shown in Figure 100.

   Note: Since sand and abrasive material can wear away the metal that connects the flat and curved parts of the blade, check the blade before using the mower. If you notice wear, replace the blade (Figure 100).

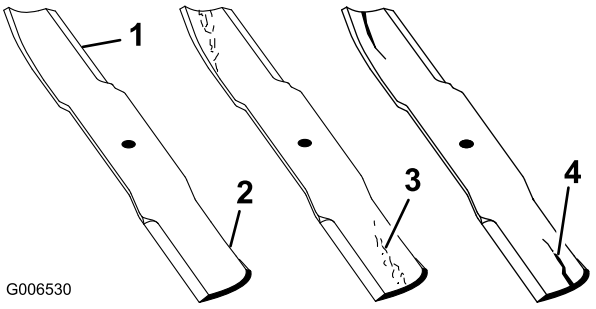


Figure 100

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

3. Examine the cutting edges of all of the blades.
4. Sharpen the cutting edges if they are dull or nicked (Figure 101).

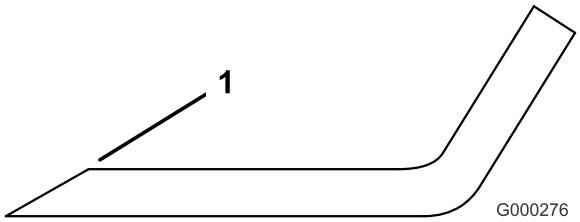


Figure 101

1. Sharpen at the original angle.

Note: Sharpen only the top of the cutting edge and maintain the original cutting angle to ensure the sharpness.

Note: The blade will remain balanced if the same amount of metal is removed from both cutting edges.

Note: Remove the blades and sharpen them on a grinder. After sharpening the cutting edges, install the blade with the anti-scalp cup and blade bolt; refer to Removing and Installing a Blade (page 61).

Correcting a Mower-Deck Mismatch

When there is mismatch between the blades on a single mower deck, the grass appears streaked when it is cut. You can correct this problem by ensuring that the blades are straight.

1. Using a 1 m (3 ft) long carpenter's level, find a level surface on the shop floor.
2. Raise the height of cut to the highest position; refer to Adjusting the Height of Cut (page 26).
3. Lower the mower deck onto a flat surface and remove the covers from the top of the mower deck.
4. Rotate the blades until the ends face forward and backward.
5. Measure from the floor to the front tip of the cutting edge (record this dimension).
6. Rotate the same blade, so that the opposite end is forward and measure it again.

   Note: The difference between the dimensions must not exceed 3 mm (1/8 inch). If the dimension exceeds 3 mm (1/8 inch), replace the blade, because it is bent. Measure all the blades.
7. Ensure that the deck is level from side to side and adjust as required.
8. Install the belt covers.

Miscellaneous Maintenance

Servicing the Spark-Arrestor Muffler

Service Interval: Every 250 hours—Service the spark arrestor.

1. Remove the pipe plug from the clean-out port at the lower side of the muffler.

⚠ CAUTION

The muffler may be hot and could cause injury.

Be careful while working around the muffler.

2. Start the engine and plug the normal muffler exit with a block of wood or metal plate so that the exhaust flow is forced out of the clean-out port. Continue to block the exit until carbon deposits cease coming out of the port.

⚠ CAUTION

Do not stand in line with the clean-out port.

Always wear safety glasses.

3. Shut off the engine and replace the pipe plug.

Cleaning the Cab Air Filters

Service Interval: Every 250 hours

1. Remove the screws and grates from both the in-cab and rear cab air filters (Figure 102 and Figure 103).

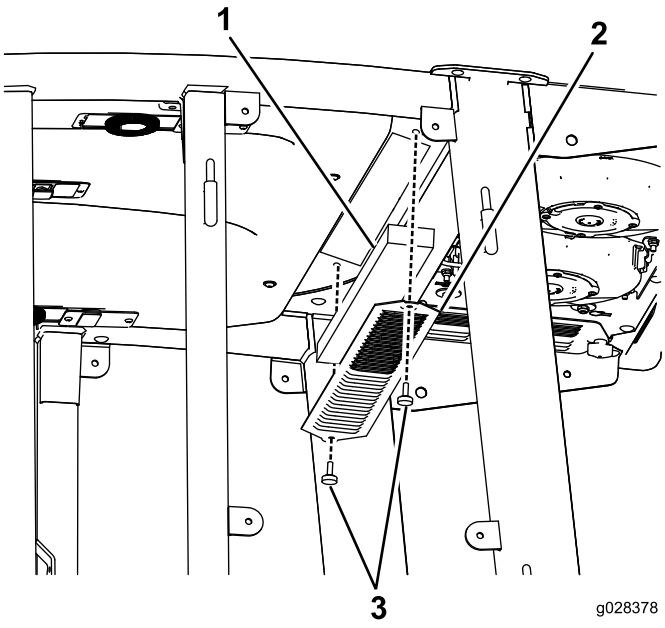


Figure 102
In-Cab Air Filter

1. Filter
2. Grate
3. Screw

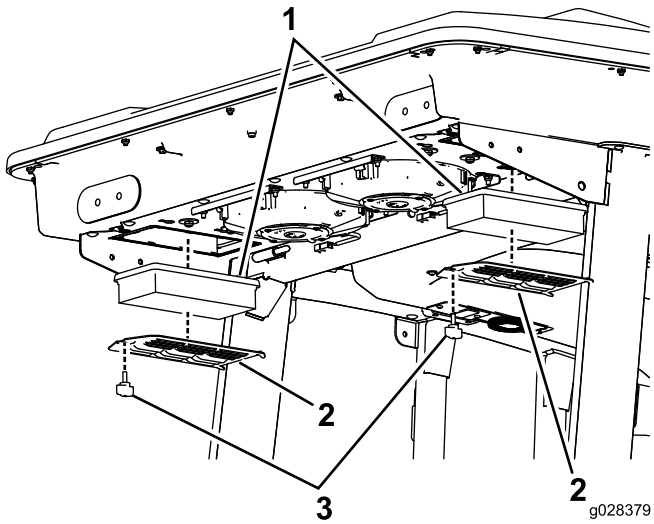


Figure 103
Rear Cab Air Filter

1. Filter
2. Grate
3. Screw

2. Clean the filters by blowing clean, oil-free, compressed air through them.

   Important: If either filter has a hole, tear, or other damage, replace the filter.

3. Install the filters and the grate with the thumb screws.

Cleaning the Air-Conditioning Assembly

Service Interval: Every 250 hours (more frequently in extremely dusty or dirty conditions).

1. Perform the premaintenance procedure; refer to Preparing the Machine for Maintenance (page 38).
2. Disconnect the wire for each fan.

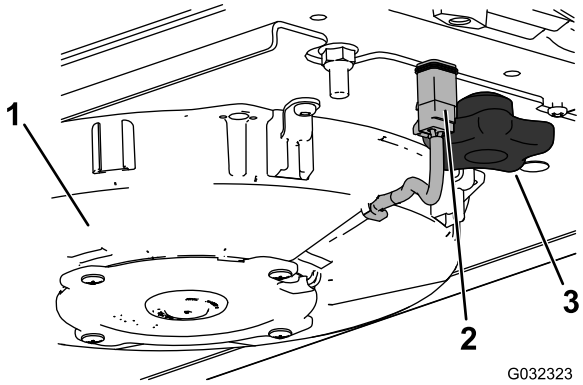


Figure 104
Right fan shown

1. Fan
2. Wire
3. Knob

3. Remove the 2 knobs and remove the fan assembly.
4. Open the 4 latches on the air-conditioning assembly and remove the screen.

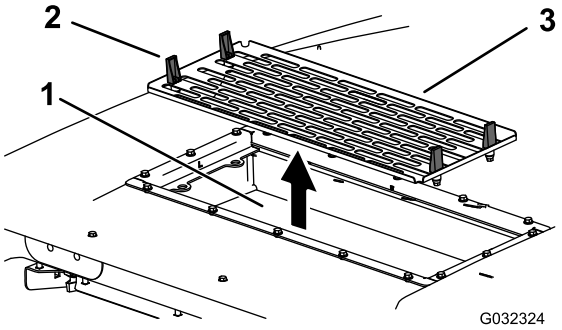


Figure 105

1. Air-conditioning coil
2. Latch
3. Air-conditioning screen

5. Remove the air filters (see Figure 103).
6. Clean the air-conditioning assembly.
7. Install the air filters, screen, and fan assembly (Figure 103, Figure 105, and Figure 104).
8. Connect the wire for each fan (Figure 104).

Cleaning

Cleaning the Cab

Important: Carefully clean around the cab seals and lights (Figure 106). If you are using a pressure washer, keep the washer wand at least 0.6 m (2 ft) away from the machine. Do not use the pressure washer directly on the cab seals and lights or under the rear overhang.

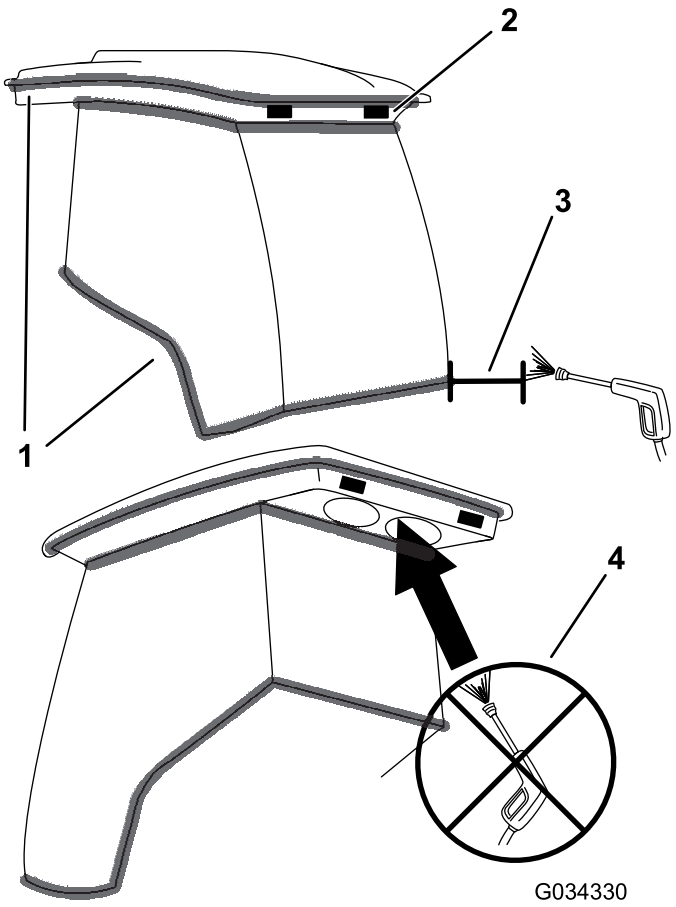


Figure 106

1. Seal
2. Light
3. Keep wand 0.6 m (2 ft) away.
4. Do not pressure-wash under the rear overhang.

Disposing of Waste

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

Storage

Preparing for Seasonal Storage

Traction Unit

1. Thoroughly clean the traction unit, mower decks, and the engine.

   Important: Do not use high-pressure water near Info Center

2. Check the tire pressure; refer to Checking the Tire Pressure (page 25).
3. Check all fasteners for looseness; tighten as necessary.
4. Grease or oil all grease fittings and pivot points. Wipe up 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 every 60 days for 24 hours to prevent lead sulfation of the battery.

Engine

1. Drain the engine oil from the oil pan and install the drain plug.
2. Remove and discard the oil filter. Install a new oil filter.
3. Refill the oil pan with 8.04 L (8.5 US qt) of SAE 15W-40 CH-4, CI-4 or higher motor oil.
4. Start the engine and run it at idle speed for approximately two minutes.
5. Shut off the engine.
6. Flush the fuel tank with fresh, clean diesel fuel.
7. Secure all of the fuel system fittings.
8. Thoroughly clean and service the air cleaner assembly.
9. Seal the air cleaner inlet and the exhaust outlet with weatherproof tape.
10. Check the anti freeze protection and add a 50/50 solution of water and ethylene glycol anti-freeze as needed for the expected minimum temperature in your area.

Notes:

Notes:

Notes:

The Toro Warranty

A Two-Year Limited Warranty

Conditions and Products Covered

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

Instructions for Obtaining Warranty Service

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

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

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

Owner Responsibilities

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

Items and Conditions Not Covered

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

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

Parts

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

Deep Cycle and Lithium-Ion Battery Warranty:

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

Maintenance is at Owner's Expense

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

General Conditions

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

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

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

Note regarding engine warranty:

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

Countries Other than the United States or Canada

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

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