



Count on it.

Form No. 3424-305 Rev A

Operator's Manual

Reelmaster® 5610 Traction Unit

Model No. 03678—Serial No. 403300001 and Up



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

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.

⚠ WARNING

CALIFORNIA
Proposition 65 Warning

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

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.

Use of this product may cause exposure to chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

Introduction

This machine is a ride-on, reel-blade lawn mower intended to be used by professional, hired operators in commercial applications. It is primarily designed for cutting grass on well-maintained turf.

Important: To maximize the safety, performance, and proper operation of this machine, carefully read and fully understand the contents of this *Operator's Manual*. Failing to follow these operating instructions or to receive proper training may result in injury. For more information on safe operating practices, including safety tips and training materials, go to www.Toro.com.

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.

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

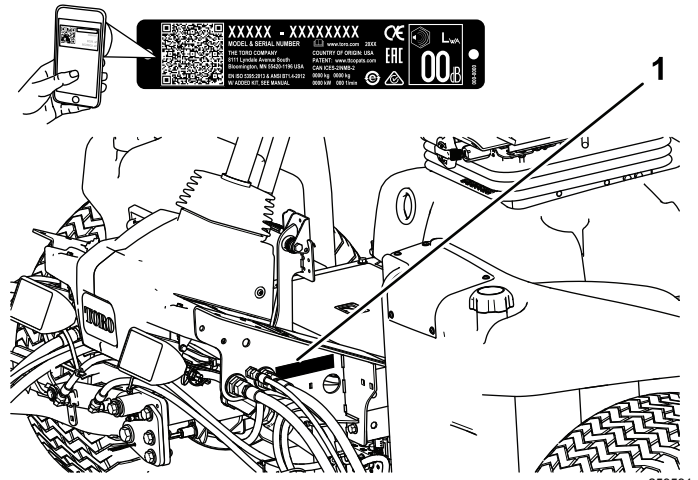


Figure 1

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
Safety-alert symbol

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

Contents

Safety	4	Draining the Fuel Tank	42
General Safety	4	Checking the Fuel Lines and	
Safety and Instructional Decals	4	Connections	42
Setup	9	Servicing the Water Separator	42
1 Adjusting the Tire Pressure	9	Servicing the Fuel Pick-up Tube Screen	42
2 Adjusting the Control-Arm Position	9	Bleeding Air from the Fuel Injectors	43
3 Installing the Cutting Units	10	Electrical System Maintenance	43
4 Adjusting the Turf-Compensation		Electrical System Safety	43
Spring	13	Servicing the Battery	43
5 Installing Rear Weights	15	Checking the Fuses	44
6 Installing the CE Hood Latch	16	Drive System Maintenance	44
7 Using the Cutting-Unit Kickstand	16	Adjusting the Traction Drive for Neutral	44
Product Overview	17	Adjusting the Rear Wheel Toe-in	45
Controls	17	Cooling System Maintenance	45
Specifications	23	Cooling System Safety	45
Attachments/Accessories	23	Removing Debris from the Cooling	
Operation	24	System	45
Before Operation Safety	24	Brake Maintenance	46
Checking the Engine-Oil Level	24	Adjusting the Parking Brakes	46
Checking the Cooling System	25	Adjusting the Parking-Brake Latch	47
Adding Fuel	25	Belt Maintenance	47
Checking the Hydraulic Fluid	26	Tensioning the Alternator Belt	47
Checking the Reel-to-Bedknife Contact	27	Hydraulic System Maintenance	48
Checking the Torque of the Wheel		Hydraulic System Safety	48
Nuts	27	Changing the Hydraulic Fluid	48
Breaking in the Machine	27	Replacing the Hydraulic Filters	48
Bleeding the Fuel System	27	Checking the Hydraulic Lines and	
During Operation Safety	28	Hoses	49
Starting and Shutting Off the Engine	29	Using the Hydraulic System Test Ports	49
Setting the Reel Speed	30	Cutting Unit System Maintenance	50
Adjusting the Lift-Arm Counterbalance	30	Cutting Unit Safety	50
Adjusting the Lift-Arm Turnaround		Backlapping the Cutting Units	50
Position	30	Storage	52
Pushing or Towing the Machine	31	Preparing the Traction Unit	52
Understanding the Diagnostic Light	31	Preparing the Engine	52
Checking the Interlock Switches	31		
After Operation Safety	32		
Hauling the Machine	32		
Identifying the Tie-Down Points	32		
Jacking Points	33		
Hydraulic Valve Solenoid Functions	33		
Operating Tips	33		
Maintenance	35		
Recommended Maintenance Schedule(s)	35		
Daily Maintenance Checklist	36		
Service Interval Chart	37		
Pre-Maintenance Procedures	37		
Pre-Maintenance Safety	37		
Lubrication	37		
Greasing the Bearings and Bushings	37		
Engine Maintenance	40		
Engine Safety	40		
Servicing the Air Cleaner	40		
Servicing the Engine Oil and Filter	40		
Adjusting the Throttle	41		
Fuel System Maintenance	42		

Safety

This machine meets or exceeds EN ISO 5395:2013 and ANSI B71.4-2017, when equipped with rear weight. Refer to the section in this manual on Installing Rear Weights.

General Safety

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

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

- Read and understand the contents of this *Operator's Manual* before starting the engine.
- Do not put your hands or feet near moving components of the machine.
- Do not operate the machine without all guards and other safety protective devices in place and working on the machine.

- Use your full attention while operating the machine. Do not engage in any activity that causes distraction; otherwise, injury or property damage may occur.
- Keep clear of any discharge opening. Keep bystanders and pets a safe distance away from the machine.
- Keep children out of the operating area. Never allow children to operate the machine.
- Stop the machine and shut off the engine before servicing, fueling, or unclogging the machine.

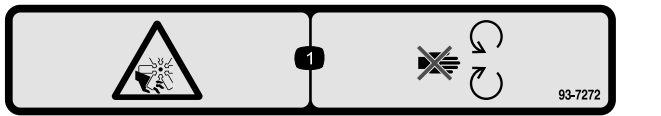
Improperly using or maintaining this machine can result in injury. To reduce the potential for injury, comply with these safety instructions and always pay attention to the safety-alert symbol **▲**, which means Caution, Warning, or Danger—personal safety instruction. Failure to comply with these instructions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

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

Safety and Instructional Decals



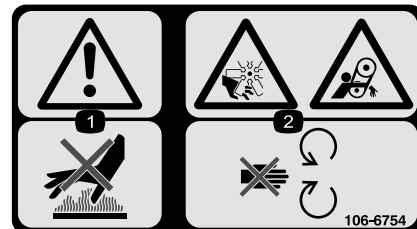
Safety decals and instructions are easily visible to the operator and are located near any area of potential danger. Replace any decal that is damaged or missing.



93-7272

decal93-7272

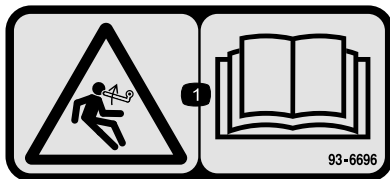
1. Cutting/dismemberment hazard; fan—stay away from moving parts.



106-6754

decal106-6754

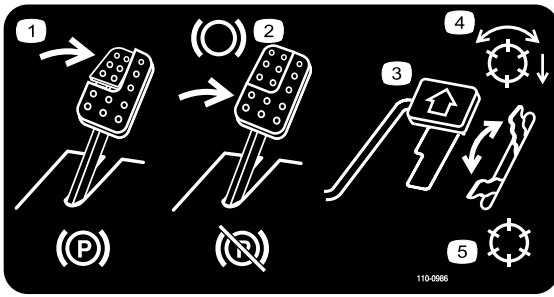
1. Warning—do not touch the hot surface.
2. Cutting/dismemberment hazard, fan and entanglement hazard, belt—stay away from moving parts.



93-6696

decal93-6696

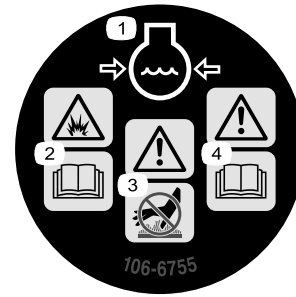
1. Stored energy hazard—read the *Operator's Manual*.



110-0986

decal110-0986

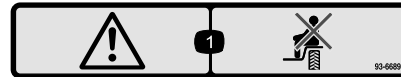
1. Press the brake pedal and parking brake pedal to set the parking brake.
2. Press the brake pedal to apply the brake.
3. Press the traction pedal to move the machine forward.
4. Reel enabled mode
5. Transport mode



106-6755

decal106-6755

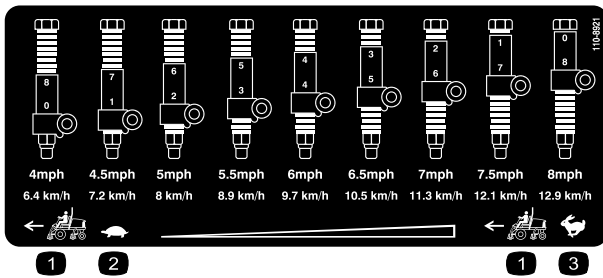
1. Engine coolant under pressure.
2. Explosion hazard—read the *Operator's Manual*.
3. Warning—do not touch the hot surface.
4. Warning—read the *Operator's Manual*.



93-6689

decal93-6689

1. Warning—do not carry passengers.



110-8921

decal110-8921

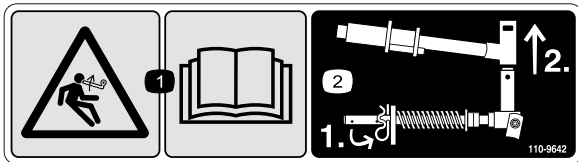
1. Traction unit speed
2. Slow
3. Fast



93-6688

decal93-6688

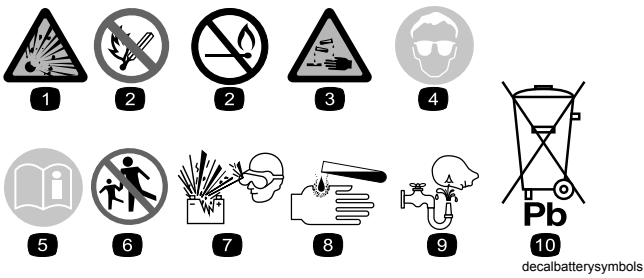
1. Warning—read the instructions before servicing or performing maintenance.
2. Cutting hazard of hand or foot—stop the engine and wait for moving parts to stop.



110-9642

decal110-9642

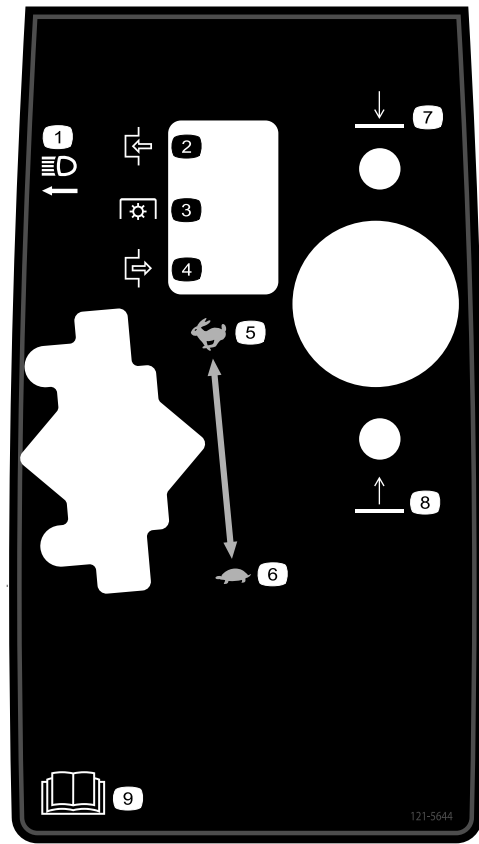
1. Stored energy hazard—read the *Operator's Manual*.
2. Move the cotter pin to the hole closest to the rod bracket and then remove the lift arm and pivot yoke.



Battery Symbols

Some or all of these symbols are on your battery.

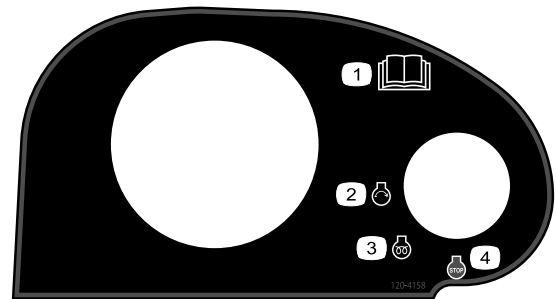
- | | |
|--|---|
| 1. Explosion hazard | 6. Keep bystanders a safe distance from the battery. |
| 2. No fire, open flame, or smoking. | 7. Wear eye protection; explosive gases can cause blindness and other injuries. |
| 3. Caustic liquid/chemical burn hazard | 8. Battery acid can cause blindness or severe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



121-5644

decal121-5644

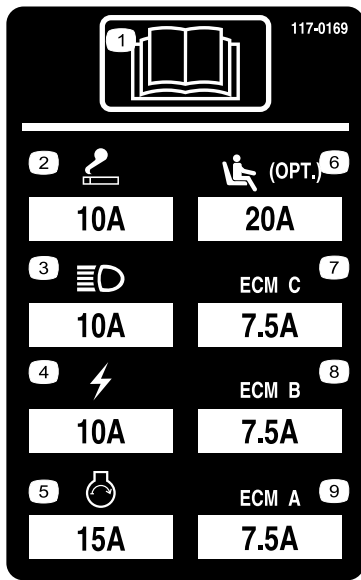
- | | |
|-------------------|--|
| 1. Light switch | 6. Slow |
| 2. Engage | 7. Lower |
| 3. Power take-off | 8. Raise |
| 4. Disengage | 9. Read the <i>Operator's Manual</i> . |
| 5. Fast | |



120-4158

decal120-4158

- | | |
|--|-------------------|
| 1. Read the <i>Operator's Manual</i> . | 3. Engine—preheat |
| 2. Engine—start | 4. Engine—stop |



117-0169

r:\decals\117-0169

1. Read the *Operator's Manual*.
2. Power point—10 A
3. Head lights—10 A
4. Power—10 A
5. Engine start—15 A
6. Optional air ride seat suspension—10 A
7. Engine computer management C—10 A
8. Engine computer management B—10 A
9. Engine computer management A—10 A

WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov.
For more information, please visit www.tcoCAProp65.com

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.

133-8062

133-8062

decal133-8062



133-2930

decal133-2930

1. Warning—read the *Operator's Manual*; do not operate this machine unless you are trained.
2. Warning—wear hearing protection.
3. Thrown object hazard—keep bystanders a safe distance away from the machine.
4. Tipping hazard—slow the machine before turning; do not turn at high speeds; only drive on slopes with the cutting units lowered; always wear a seatbelt.
5. Warning—do not park on slopes; lock the parking brake, stop the engine and remove the ignition key before leaving the machine.
6. Warning—read the *Operator's Manual*; do not tow the machine.



decal133-2931

133-2931

(Affix over Part No. 133-2930)

Note: This machine complies with the industry standard stability test in the static lateral and longitudinal tests with the maximum recommended slope indicated on the decal. Review the instructions for operating the machine on slopes in the Operator's Manual as well as the conditions in which you would operate the machine to determine whether you can operate the machine in the conditions on that day and at that site. Changes in the terrain can result in a change in slope operation for the machine. If possible, keep the cutting units lowered to the ground while operating the machine on slopes. Raising the cutting units while operating on slopes can cause the machine to become unstable.

1. Warning—read the *Operator's Manual*; do not operate this machine unless you are trained.
2. Warning—wear hearing protection.
3. Thrown object hazard—keep bystanders a safe distance away from the machine
4. Tipping hazard—do not drive across or down slopes greater than 15 degrees; only drive on slopes with the cutting units lowered; always wear a seatbelt
5. Warning—do not park on slopes; engage the parking brake, shut off the engine, and remove the ignition key before leaving the machine.
6. Warning—read the *Operator's Manual*; do not tow the machine.

REELMASTER 5010-H/ 5410/5510/5610 & GROUNDMASTER 4300
QUICK REFERENCE AID

CHECK/SERVICE (daily)

1. OIL LEVEL, ENGINE
2. OIL LEVEL, HYDRAULIC TANK
3. COOLANT LEVEL, RADIATOR
4. FUEL /WATER SEPARATOR
5. PRECLEANER – AIR CLEANER
6. RADIATOR SCREEN
7. BRAKE FUNCTION
8. TIRE PRESSURE
9. BELTS (FAN, ALT.)

GREASING -- SEE OPERATOR'S MANUAL

FLUID SPECIFICATIONS/CHANGE INTERVALS

SEE OPERATOR'S MANUAL FOR INITIAL CHANGES.	FLUID TYPE	CAPACITY	CHANGE INTERVAL		FILTER PART NO.
			FLUID	FILTER	
A. ENGINE OIL	SAE 15W-40CI-4	3.5 QTS* (5010-H) 5.5 QTS.*	150 HRS.	150 HRS.	104-5167
B. HYD. CIRCUIT OIL	ISO VG 46/68	11 GALS* (5010-H) 15 GALS.*	800 HRS.	SEE INDICATOR 800 HRS.	94-2621** 86-3010
C. AIR CLEANER				SEE INDICATOR	108-3810 (8010-H) (5410) (5510) 108-3812 (5610) (4300)
D. WATER SEPARATOR				400 HRS.	110-9049
E. FUEL TANK	NO. 2-DIESEL	14 GALS.	DRAIN AND FLUSH, 2 YRS.		
F. COOLANT	50/50 ETHYLENE GLYCOL/WATER	5.5 QTS. (5010-H)	DRAIN AND FLUSH, 2 YRS.		
		7.0 QTS. (5410) (5510)			
		10.0 QTS. (5610) (4300)			

* INCLUDING FILTER ** EXCLUDES 5010-H

125-8753

decal125-8753

125-8753

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

8

Setup

Loose Parts

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

Procedure	Description	Qty.	Use
1	No parts required	–	Adjust the tire pressure.
2	No parts required	–	Adjust the control-arm position.
3	Right, front hose guide Left, front hose guide	1 1	Install the cutting units.
4	No parts required	–	Adjust the turf-compensation spring.
5	Rear weights (size varies with configuration).	Varies	Install rear weights (order from your Toro Distributor).
6	Hood latch assembly Washer	1 1	Install the CE hood latch.
7	Cutting-unit kickstand	1	Install the cutting-unit kickstand.

Media and Additional Parts

Description	Qty.	Use
Operator's Manual	1	Read the Operator's Manual before operating the machine.
Engine owner's manual	1	Engine information
Declaration of Conformity	1	Declaration of conformity
Operator training material	1	Review before operating the machine

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

1

Adjusting the Tire Pressure

No Parts Required

Procedure

The tires are over-inflated for shipping. Therefore, release some of the air to reduce the pressure. Correct air pressure in the front and rear tires is 83 to 103 kPa (12 to 15 psi).

Important: Maintain even pressure in all tires to ensure uniform contact with the turf.

2

Adjusting the Control-Arm Position

No Parts Required

Procedure

The control-arm position can be adjusted for your comfort.

1. Loosen the 2 bolts securing the control arm to the retaining bracket (Figure 3).

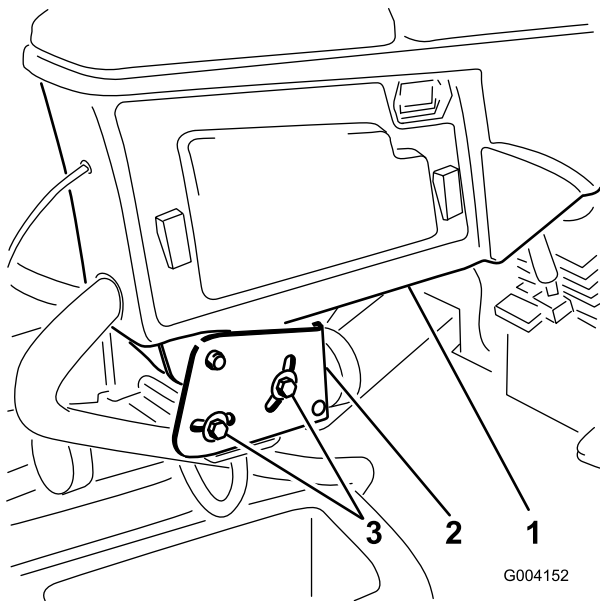


Figure 3

1. Control arm
2. Retaining brackets
3. Bolts (2)

2. Rotate the control arm to the desired position and tighten the 2 bolts.

3

Installing the Cutting Units

Parts needed for this procedure:

1	Right, front hose guide
1	Left, front hose guide

Procedure

1. Remove the reel motors from the shipping brackets.

Note: Discard the shipping brackets.

2. Remove the cutting units from the cartons.
3. Assemble and adjust the cutting units as described in the *Operator's Manual* for the cutting units.
4. Make sure that the counter weight (Figure 4) is installed to the proper end of each cutting unit as described in the *Operator's Manual* for the cutting units.

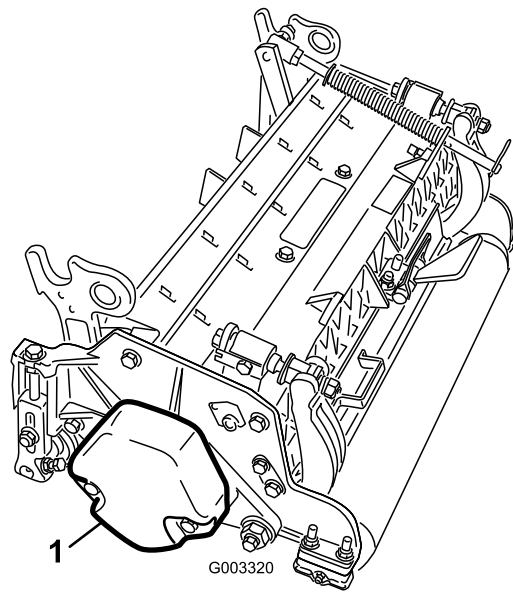


Figure 4

1. Counter weight

5. Mount the turf-compensation spring to the same side of the cutting unit as the reel-drive motor. Reposition the turf-compensation spring as follows:

Note: All cutting units are shipped with the turf-compensation spring mounted to the right side of the cutting unit.

- A. Remove the 2 carriage bolts and nuts securing the rod bracket to the cutting-unit tabs (Figure 5).

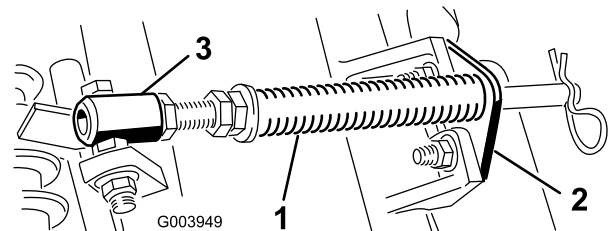


Figure 5

1. Turf-compensation spring
2. Rod bracket
3. Spring tube

- B. Remove the flange nut securing the spring-tube bolt to the carrier-frame tab (Figure 5). Remove the assembly.
- C. Mount the spring-tube bolt to the opposite tab on the carrier frame and secure with the flange nut.

Note: Position the bolt head to the outer side of the tab as shown in Figure 6.

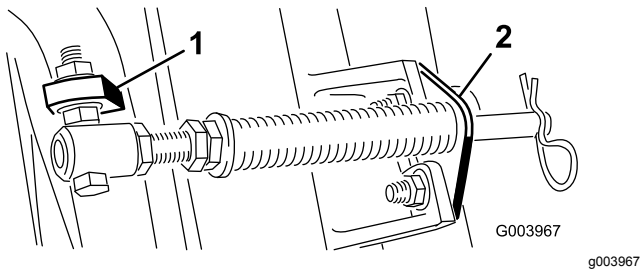


Figure 6

1. Opposite carrier-frame tab 2. Rod bracket

D. Mount the rod bracket to the cutting-unit tabs with the carriage bolts and nuts (Figure 6).

Important: On cutting unit 4 (left front) and cutting unit 5 (right front), use the rod-bracket-mounting nuts to install the hose guides to the front of the cutting-unit tabs (Figure 7 and Figure 8). The hose guides should lean toward the center cutting unit (Figure 8 and Figure 9).

Note: When installing or removing the cutting units, make sure that the hairpin cotter is installed in the spring-rod hole next to the rod bracket. When not installing or removing the cutting units, the hairpin cotter must be installed in the hole in the end of the rod.

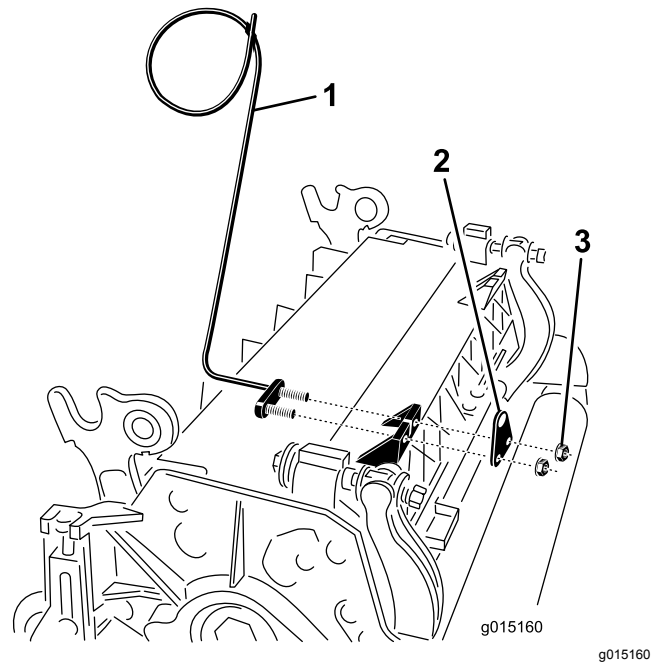


Figure 8

1. Hose guide (cutting unit 4 3. Nut shown)
2. Rod bracket

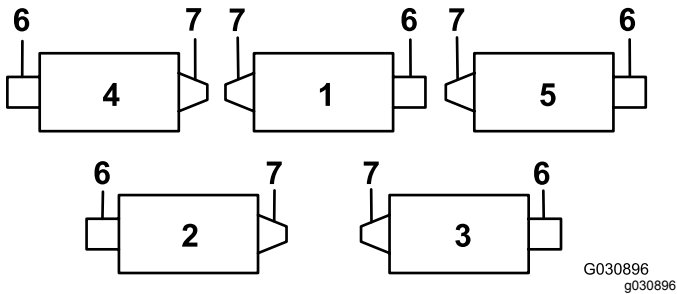


Figure 7

1. Cutting unit 1 5. Cutting unit 5
2. Cutting unit 2 6. Reel motor
3. Cutting unit 3 7. Weight
4. Cutting unit 4

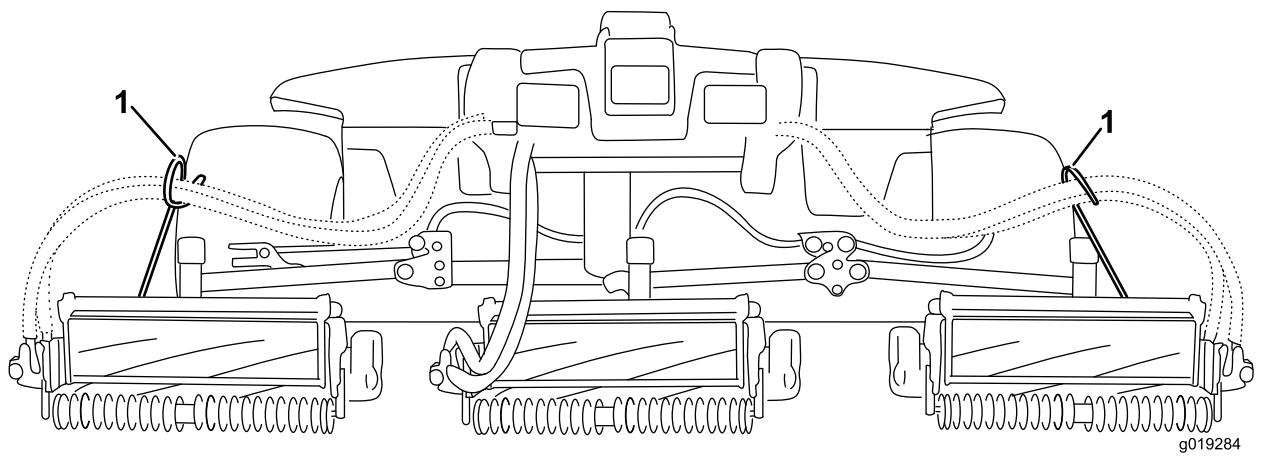


Figure 9

1. Hose guides must lean toward the center cutting unit.

6. Lower all lift arms completely.
7. Remove the snapper pin and the cap from the lift-arm-pivot yoke (**Figure 10**).

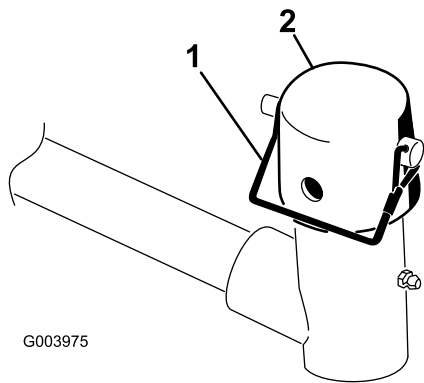


Figure 10

1. Snapper pin
2. Cap

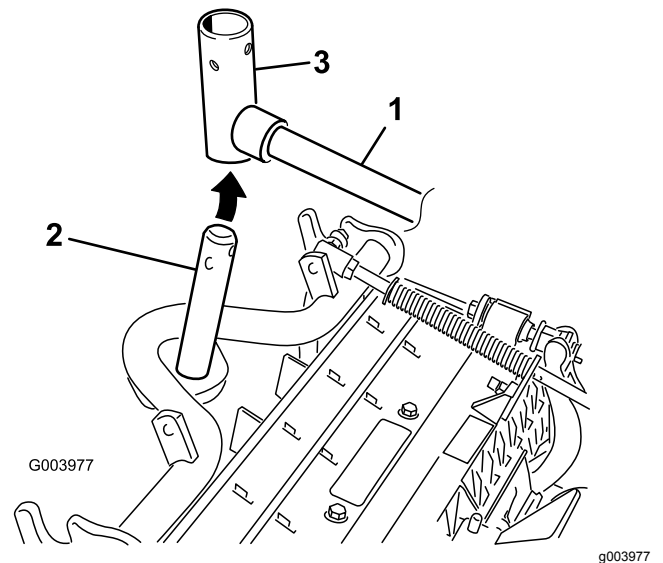


Figure 11

1. Lift arm
2. Carrier-frame shaft
3. Lift-arm-pivot yoke

8. For the front cutting units, slide a cutting unit under the lift arm while inserting the carrier-frame shaft up into the lift-arm-pivot yoke (**Figure 11**).

9. Use the following procedure on the rear cutting units when the height of cut is above 19 mm (3/4 inch).
 - A. Remove the lynch pin and washer securing the lift-arm-pivot shaft to the lift arm and slide the lift-arm-pivot shaft out of the lift arm (**Figure 12**).

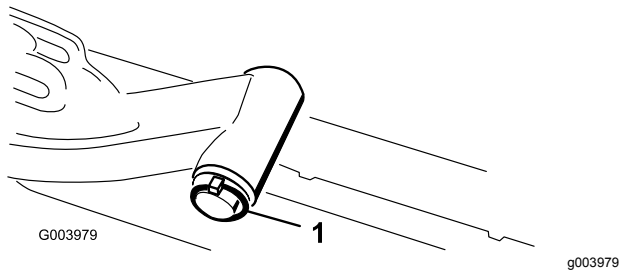


Figure 12

1. Lynch pin and washer

- B. Insert the lift-arm yoke onto the carrier-frame shaft (Figure 11).
 - C. Insert the lift-arm shaft into the lift arm and secure it with the washer and lynch pin (Figure 12).
10. Insert the cap over the carrier-frame shaft and lift-arm yoke.
 11. Secure the cap and the carrier-frame shaft to the lift-arm yoke with the snapper pin (Figure 10).

Note: Use the slot if a steering cutting unit is desired or use the hole if the cutting unit is to be locked in position

12. Secure the lift-arm chain to the chain bracket with the snapper pin (Figure 13).

Note: Use the number of chain links described in the *Operator's Manual* for the cutting unit.

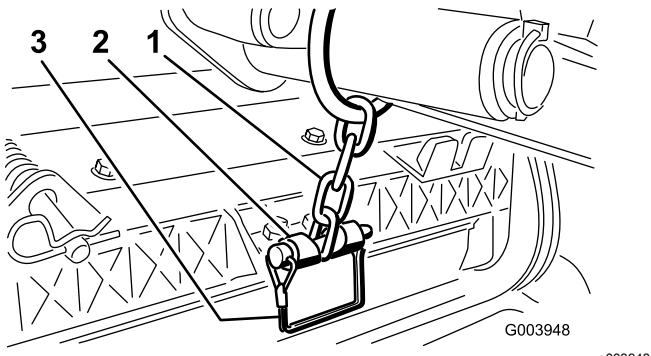


Figure 13

1. Lift-arm chain
2. Chain bracket
3. Pin

13. On cutting unit 4 (left front) and cutting unit 5 (right front), insert the reel-motor hoses into the respective hose guide.
14. Coat the spline shaft of the reel motor with clean grease.
15. Oil the reel-motor O-ring and install it onto the motor flange.
16. Install the motor by rotating it clockwise so that the motor flanges clear the bolts (Figure 14).

Note: Rotate the motor counterclockwise until the flanges encircle the bolts and then tighten the bolts.

Important: Make sure that the reel-motor hoses are not twisted, kinked, or at risk of being pinched.

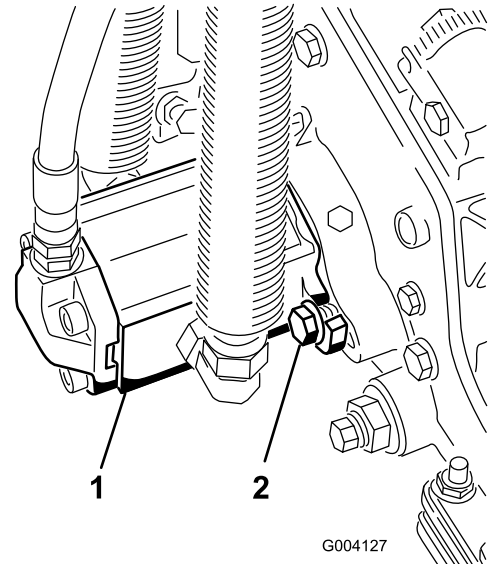


Figure 14

1. Reel-drive motor
2. Mounting bolts

4

Adjusting the Turf-Compensation Spring

No Parts Required

Procedure

The turf-compensation spring (Figure 15) transfers weight from the front to the rear roller. This helps to reduce a wave pattern in the turf, also known as marcelling or bobbing.

Important: Make spring adjustments with the cutting unit mounted to the traction unit, pointing straight ahead and lowered to the shop floor.

1. Make sure that the hairpin cotter is installed in the rear hole in the spring rod (Figure 15).

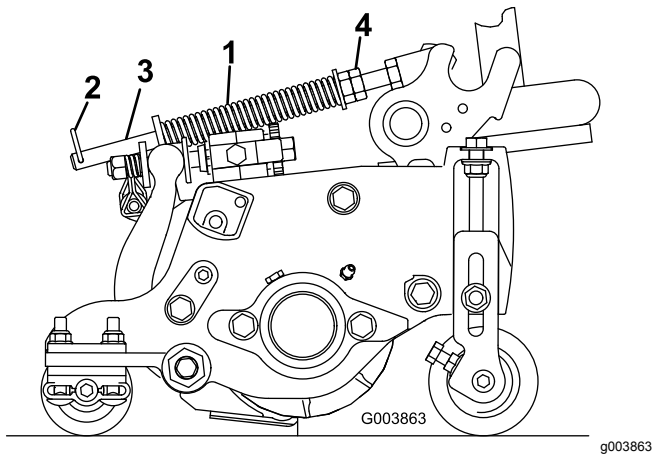


Figure 15

- | | |
|-----------------------------|---------------|
| 1. Turf-compensation spring | 3. Spring rod |
| 2. Hairpin cotter | 4. Hex nuts |

-
2. Tighten the hex nuts on the front end of the spring rod until the compressed length of the spring is 15.9 cm (6.25 inches) (Figure 15).

Note: When operating on rough terrain, decrease the spring length by 13 mm (1/2 inch). Ground following will be slightly decreased.

5

Installing Rear Weights

Parts needed for this procedure:

Varies	Rear weights (size varies with configuration).
--------	--

Procedure

This machine complies with EN ISO 5395:2013 and ANSI B71.4-2012 Standards when equipped with rear weights and/or 90 lb of calcium chloride ballast is added to rear wheels. Use the following charts to determine the combinations of weights required for your configuration. Order parts from your local Authorized Toro Distributor.

Weight P/N 110-8985-03				
Groomers, roller brushes, and/or baskets	Number of weights to meet ANSI (US) standards	Number of weights to meet CE (European) standards	Fasteners (2 each required) for weights	Weight Location
No	0	0	N/A	N/A
Yes	4	4	3231-7 Carriage Bolt, 104-8301 Nut	1 on top of bumper and 3 under bumper

Important: Always install tubes inside the rear tires before calcium chloride is installed. If a puncture occurs in a tire with calcium chloride, remove the machine from the turf area as quickly as possible. To prevent possible damage to the turf, immediately soak the affected area with water.

Use the following procedure to mount the appropriate amount of weight (see weight charts) to the top or bottom of the rear bumper as shown in [Figure 16](#).

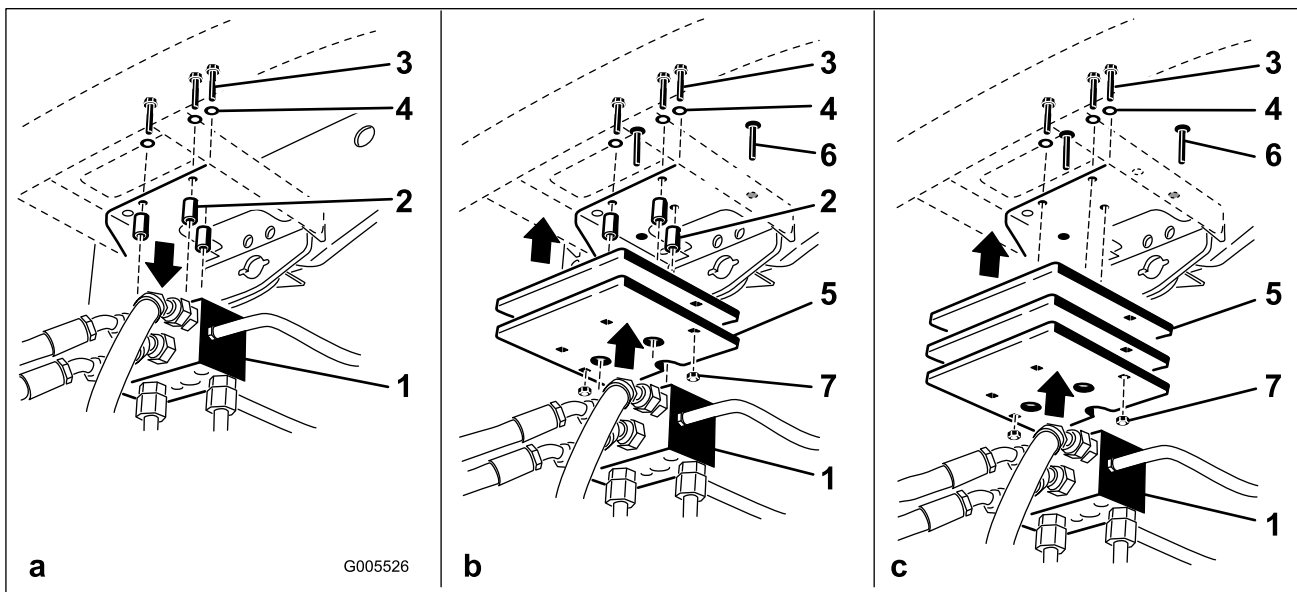


Figure 16

- | | |
|----------------------|------------------|
| 1. Traction manifold | 5. Weight(s) |
| 2. Spacers | 6. Carriage bolt |
| 3. Bolts | 7. Nut |
| 4. Washers | |

1. Remove the 3 bolts, washers, and spacers securing the traction manifold to the bottom of the rear bumper (Figure 16a).
2. Position the appropriate amount of weight on the top and/or bottom of the rear bumper.
3. Mount the weight(s) and the traction manifold to the bumper with the 3 bolts, washers and spacers previously removed (Figure 16b).

Note: Do not use the spacers when installing more than two weights **under** the bumper (Figure 16c).

4. Secure the outer edges of the weight(s) to the bumper with 2 carriage bolts and nuts (Figure 16c).

6

Installing the CE Hood Latch

Parts needed for this procedure:

1	Hood latch assembly
1	Washer

Procedure

1. Unlatch and raise the hood.
2. Remove the rubber grommet from the hole in the left side of the hood (Figure 17).

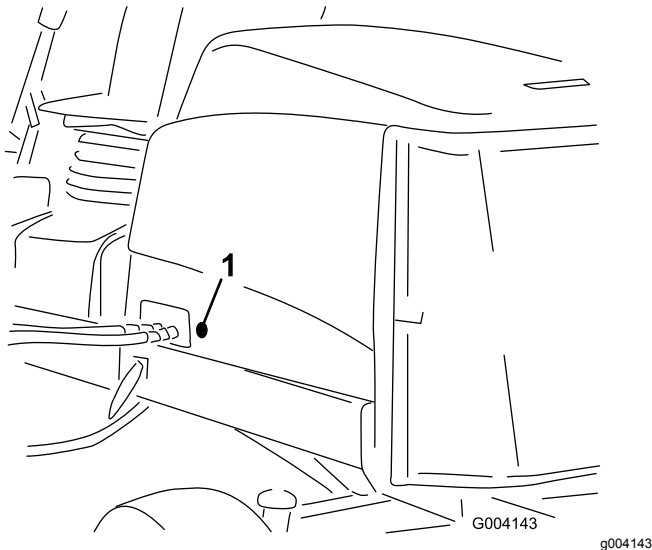


Figure 17

1. Rubber grommet

3. Remove the nut from the hood-latch assembly (Figure 18).

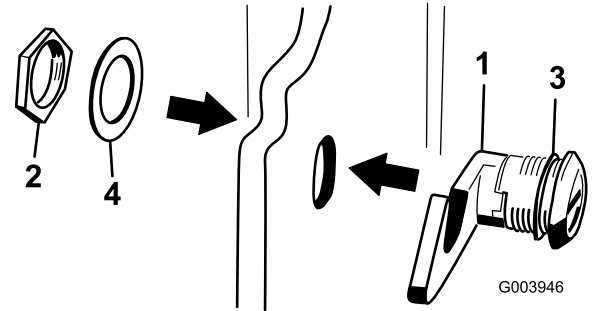


Figure 18

- | | |
|---------------|------------------|
| 1. Hood latch | 3. Rubber washer |
| 2. Nut | 4. Metal washer |

4. Outside the hood, insert the hook end of the latch through the hole in the hood.

Note: Make sure that the rubber sealing washer remains to the outer side of the hood.

5. Inside the hood, insert the metal washer onto the latch and secure with the nut.

Note: Make sure that the latch engages the frame catch when it is locked. Use the enclosed hood latch key to operate the hood latch.

7

Using the Cutting-Unit Kickstand

Parts needed for this procedure:

1	Cutting-unit kickstand
---	------------------------

Procedure

Whenever you must tip the cutting unit to expose the bedknife/reel, prop up the rear of the cutting unit with the kickstand to ensure that the nuts on the back end of the bedbar adjusting screws are not resting on the work surface (Figure 19).

Product Overview

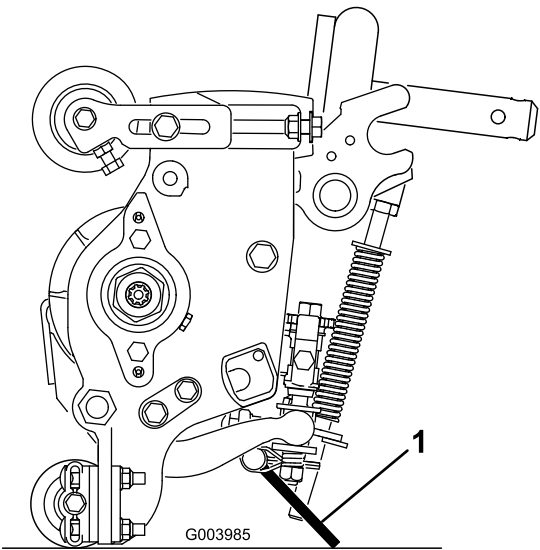


Figure 19

- 1. Cutting-unit kickstand

Secure the kickstand to the chain bracket with the snapper pin (Figure 20).

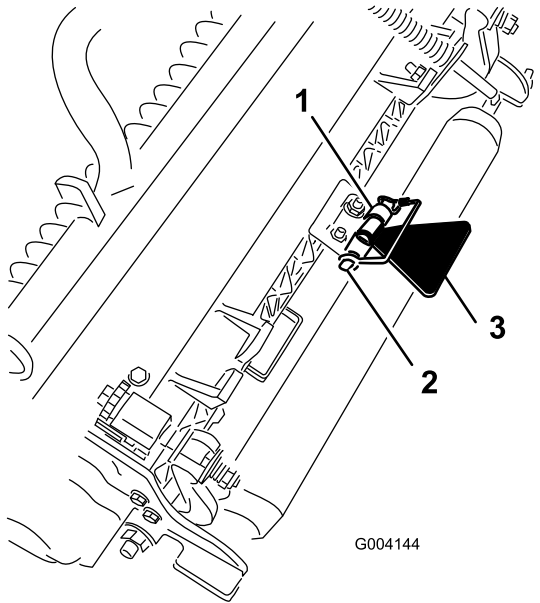


Figure 20

- 1. Chain bracket
- 2. Snapper pin
- 3. Cutting-unit kickstand

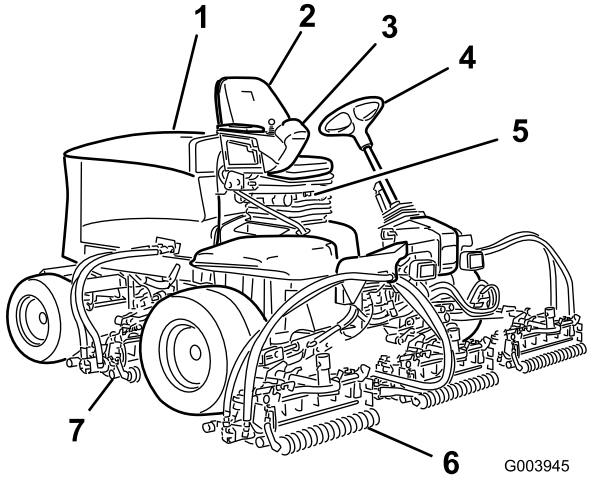


Figure 21

- 1. Engine hood
- 2. Seat
- 3. Control arm
- 4. Steering wheel
- 5. Seat adjustments
- 6. Front cutting units
- 7. Rear cutting units

Controls

Seat-Adjusting Knobs

The seat-adjusting lever (Figure 22) allows you to adjust the seat forward and rearward. The weight adjusting knob adjusts the seat for your weight. The weight gauge indicates when the seat is adjusted to your weight. The height-adjusting knob adjusts the seat for your height.

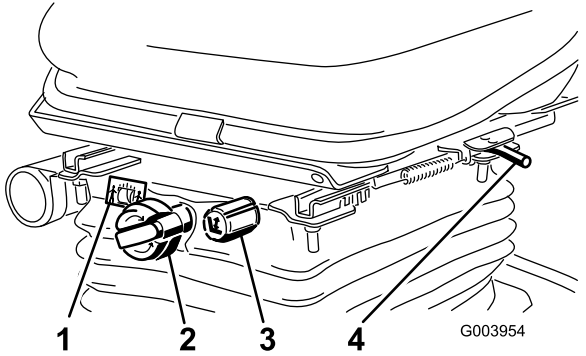


Figure 22

- 1. Weight gauge
- 2. Weight-adjusting knob
- 3. Height-adjusting knob
- 4. Adjusting lever (forward and rearward)

Traction Pedal

The traction pedal (Figure 23) controls the forward and reverse operation. Press the top of the pedal to move forward and the bottom to move rearward. Ground speed depends on how far you press the pedal. For no load, maximum ground speed, fully press the pedal while the throttle is in the FAST position.

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

Mow-Speed Limiter

When the mow-speed limiter (Figure 23) is flipped up, it controls the mow speed and allows the cutting units to be engaged. Each spacer adjusts the mowing speed by ½ mile per hour. The more spacers you have on the top of the bolt, the slower you will go. For transport, flip back the mow-speed limiter and you will have maximum transport speed.

Brake Pedal

Press the brake pedal (Figure 23) to stop the machine.

Parking Brake

To engage the parking brake, (Figure 23) push down the brake pedal and press the top forward to latch. To release the parking brake, press the brake pedal until the parking brake latch retracts.

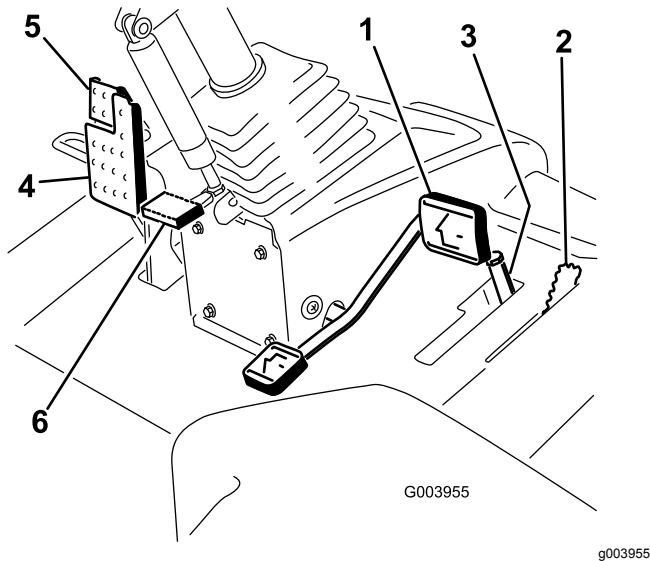


Figure 23

- | | |
|----------------------|------------------------|
| 1. Traction pedal | 4. Brake pedal |
| 2. Mow-speed limiter | 5. Parking brake |
| 3. Spacers | 6. Tilt-steering pedal |

Tilt-Steering Pedal

To tilt the steering wheel toward you, press the foot pedal (Figure 23) down, and pull the steering tower toward you to the most comfortable position and then release the pedal.

Throttle Control

Move the throttle control (Figure 24) forward to increase the engine speed and rearward to decrease speed.

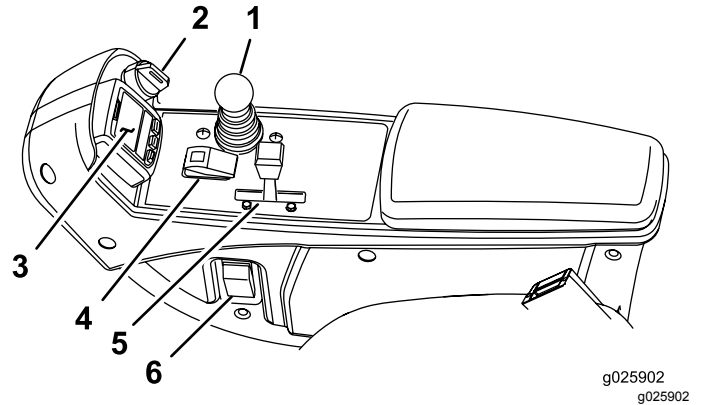


Figure 24

- | | |
|----------------------------------|--------------------------|
| 1. Lower mow/raise control lever | 4. Enable/disable switch |
| 2. Key switch | 5. Throttle control |
| 3. InfoCenter | 6. Headlight switch |

Key Switch

The key switch (Figure 24) has 3 positions: OFF, ON/PREHEAT, and START.

Lower Mow/Raise Control Lever

This lever (Figure 24) raises and lowers the cutting units and also starts and stops the cutterheads when the cutterheads are enabled in the mow mode.

Headlight Switch

Pivot the switch downward to turn on the headlights (Figure 24).

Enable/Disable Switch

Use the enable/disable switch (Figure 24) in conjunction with the lower mow/raise control lever to operate the cutterheads. The cutterheads cannot be lowered when the mow/transport lever is in the TRANSPORT position.

Backlap Levers

Use the backlap levers in conjunction with the lower mow/raise control lever for backlapping the reels (Figure 25).

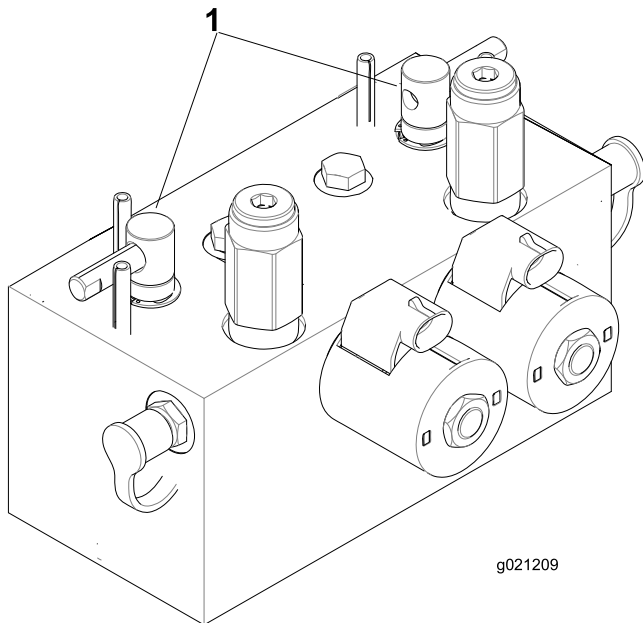


Figure 25

1. Backlap levers

Hydraulic Filter Restriction Indicator

With the engine running at normal operating temperature, view the indicator (Figure 26); it should be in the Green zone. When the indicator is in the Red zone, change the hydraulic filters.

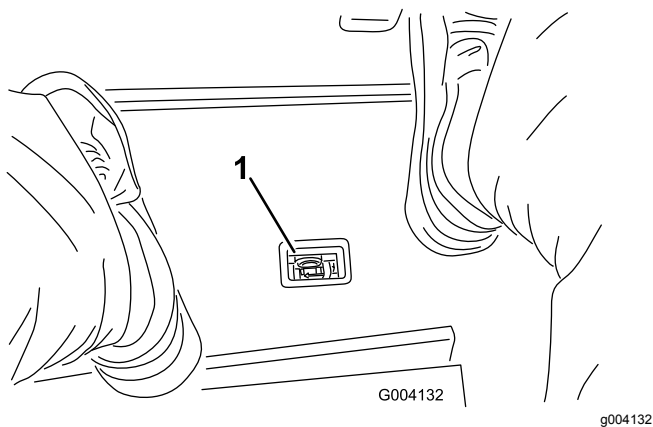


Figure 26

1. Hydraulic filter restriction indicator

Power Point

The power point is a 12 V power supply for electronic devices (Figure 27).

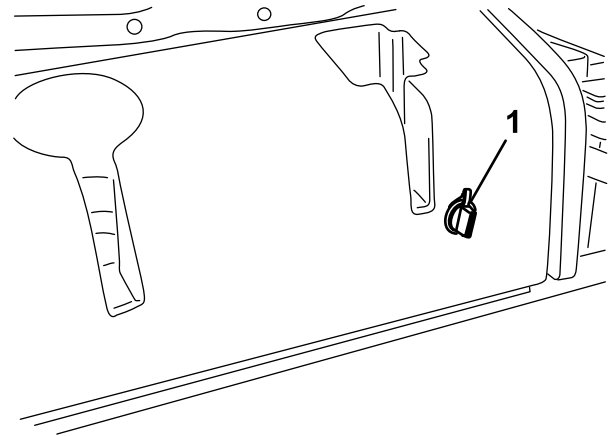


Figure 27

1. Power point

Using the InfoCenter LCD Display

The InfoCenter LCD display shows information about your machine such as the operating status, various diagnostics and other information about the machine (Figure 28). There is a splash screen and main information screen of the InfoCenter. You can switch between the splash screen and main information screen, at any time, by pressing any of the InfoCenter buttons and then selecting the appropriate directional arrow.

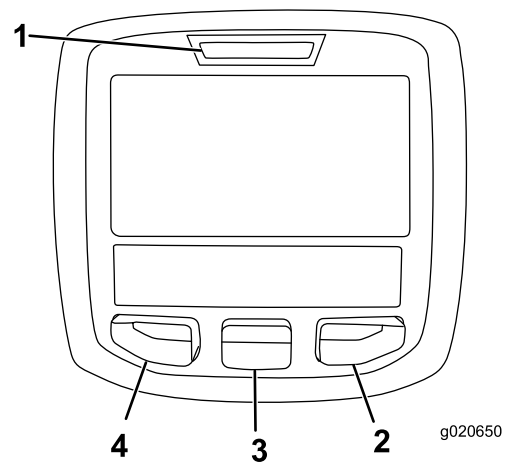


Figure 28

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














- Left Button, Menu Access/Back Button—press this button to access the InfoCenter menus. You can

use it to back out of any menu you are currently using.


















- Middle Button—use this button to scroll down menus.
- Right Button—use this button to open a menu where a right arrow indicates additional content.

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

InfoCenter Icon Description

SERVICE DUE	Indicates when scheduled service should be performed
	Hour meter
	Info icon
	Fast
	Slow
	Fuel level
	Glow plugs are active
	Raise cutting units
	Lower cutting units
	Operator must sit in seat
	Parking Brake Indicator—indicates when the parking brake is On
H	Identifies the range as High (Transport)
N	Neutral
L	Identifies the range as Low (Mow)
	Coolant Temperature—indicates the engine coolant temperature in either °C or °F
	Temperature (hot)
	PTO is engaged

InfoCenter Icon Description (cont'd.)

	Denied or not allowed
	Engine Start
	Stop or shutdown
	Engine
	Key switch
	Indicates when the cutting units are being lowered
	Indicates when the cutting units are being raised
PIN	PIN passcode
CAN	CAN bus
	InfoCenter
Bad	Bad or failed
	Bulb
OUT	Output of TEC controller or control wire in harness
	Switch
	Operator must release switch
	Operator should change to indicated state
Symbols are often combined to form sentences. Some examples are shown below	
	Operator should put machine in neutral
	Engine start denied
	Engine shutdown
	Engine coolant too hot
	Sit down or set parking brake

Using the Menu

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

Main Menu	
Menu Item	Description
Faults	The Faults menu contains a list of the recent machine faults. Refer to the Service Manual or your Authorized Toro Distributor for more information on the Faults menu and the information contained there.
Service	The Service menu contains information on the machine such as hours of use, counters, and other similar numbers.
Diagnostics	The Diagnostics menu displays the state of each machine switch, sensor, and control output. You can use this to troubleshoot certain issues as it will quickly tell you which machine controls are on and which are off.
Settings	The Settings menu allows you to customize and modify configuration variables on the InfoCenter display.
About	The About menu lists the model number, serial number, and software version of your machine.

Service	
Menu Item	Description
Hours	Lists the total number of hours that the machine, engine and PTO have been on, as well as the number of hours the machine has been transported and service due.
Counts	Lists numerous counts the machine has experienced.

Diagnostics	
Menu Item	Description
Cutting Units	Indicates the inputs, qualifiers, and outputs for raising and lowering the cutting units.
Hi/Low Range	Indicates the inputs, qualifiers, and outputs for driving in transport mode.

PTO	Indicates the inputs, qualifiers, and outputs for enabling the PTO circuit.
Engine Run	Indicates the inputs, qualifiers, and outputs for starting the engine.
Backlap	Indicates the inputs, qualifiers and outputs for operating the backlap function.

Settings	
Menu Item	Description
Units	Controls the units used on the InfoCenter. The menu choices are English or Metric
Language	Controls the language used on the InfoCenter*.
LCD Backlight	Controls the brightness of the LCD display.
LCD Contrast	Controls the contrast of the LCD display.
Front Backlap Reel Speed	Controls the speed of the front reels in backlap mode.
Rear Backlap Reel Speed	Controls the speed of the rear reels in backlap mode.
Protected Menus	Allows the superintendent/mechanic to access protected menus by inputting a passcode.
Blade Count	Controls the number of blades on the reel for reel speed.
Mow Speed	Controls the ground speed for determining the reel speed.
Height of cut (HOC)	Controls the height of cut (HOC) for determining the reel speed.
F Reel RPM	Displays the calculated reel speed position for the front reels. The reels can also be manually adjusted.
R Reel RPM	Displays the calculated reel speed position for the rear reels. The reels can also be manually adjusted.

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

About	
Menu Item	Description
Model	Lists the model number of the machine.
SN	Lists the serial number of the machine.

Machine Controller Revision	Lists the software revision of the master controller.
InfoCenter Revision	Lists the software revision of the InfoCenter.
CAN Bus	Lists the machine communication bus status.

Protected Menus

There are 5 operating configuration settings that are adjustable within the Settings Menu of the InfoCenter: Blade Count, Mow Speed, Height of Cut (HOC), F Reel RPM and R Reel RPM. These settings can be locked by using the Protected Menu.

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

Accessing the Protected Menu Settings

To access the Protected Menu Settings

- From the Main Menu, scroll down to the Settings Menu and press the right button.
- In the Settings Menu, scroll down to the Protected Menu and press the right button.
- To enter the passcode, use the center button to set the first digit then press the right button to move on to the next digit.
- Use the center button to set the second digit then press the right button to move on to the next digit.
- Use the center button to set the third digit then press the right button to move on to the next digit.
- Use the center button to set the fourth digit then press the right button.
- Press the middle button to enter the code.
- If the code has been accepted and the protected menu has been “Unlocked,” “PIN” will be displayed in the upper right corner of the display screen.

The ability to view and change the settings in the Protected Menu can be changed. Once you have accessed the Protected Menu, scroll down to Protect Settings. Using the right button, changing Protect Settings to Off allows you to view and change the settings in the Protected Menu without entering the passcode. Changing Protect Settings to On hides the protected options and requires entering a passcode to change the setting in the Protected Menu. After the pass code has been set, the key switch must be turned off and back on to enable and save this feature.

Note: If the passcode has been forgotten or misplaced, please contact your distributor for assistance.

Setting the Blade Count

1. In the Settings Menu, scroll down to Blade Count.
2. Press the right button to change the blade count between 5, 8, or 11 blade reels.

Setting the Mow Speed

1. In the Settings Menu, scroll down to Mow Speed.
2. Press the right button to select mow speed.
3. Use the middle and right buttons to select the appropriate mow speed set on the mechanical mow-speed limiter on the traction pedal.
4. Press the left button to exit mow speed and save the setting.

Setting the Height of Cut (HOC)

1. In the Settings Menu, scroll down to HOC.
2. Press the right button to select HOC.
3. Use the middle and right buttons to select the appropriate HOC setting. (If the exact setting is not displayed, select the nearest HOC setting from the list displayed).
4. Press the left button to exit HOC and save the setting.

Setting the Front and Rear Reel Speeds

Although the front and rear reel speeds are calculated by inputting the number of blades, mow speed and HOC into the InfoCenter, the setting can be manually changed to accommodate for different mowing conditions.

1. To change the Reel Speed Settings, scroll down to the F Reel RPM, R Reel RPM, or both.
2. Press the right button to change the reel speed value. As you change the speed setting, the display continues to show the calculated reel speed based on blade count, mow speed and HOC, which was previously entered, but the new value is also displayed.

Specifications

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

Specification	
Transport Width	233 cm (92 inches)
Width of cut	254 cm (100 inches)
Length	282 cm (111 inches)
Height	160 cm (63 inches)
Weight	1276 kg (2,813 lb)
Engine	Kubota 44.2 hp (Turbo)
Fuel tank capacity	53 L (14 US gallons)
Transport speed	0 to 16 km/h (0 to 10 mph)
Mowing speed	0 to 13 km/h (0 to 8 mph)

Attachments/Accessories

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

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

Operation

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

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 shut off the engine quickly.
- Check that operator-presence controls, safety switches, and shields are attached and functioning properly. Do not operate the machine unless they are functioning properly.
- Before mowing, always inspect the machine to ensure that the blades, blade bolts, and cutting assemblies are in good working condition. Replace worn or damaged blades and bolts in sets to preserve balance.
- Inspect the area where you will use the machine and remove all objects that the machine could throw.

Fuel Safety

- Use extreme care in handling fuel. It is flammable and its vapors are explosive.
- Extinguish all cigarettes, cigars, pipes, and other sources of ignition.
- Use only an approved fuel container.
- Do not remove the fuel cap or fill the fuel tank while the engine is running or hot.
- Do not add or drain the fuel in an enclosed space.
- Do not store the machine or fuel container where there is an open flame, spark, or pilot light, such as on a water heater or other appliance.
- If you spill fuel, do not attempt to start the engine; avoid creating any source of ignition until the fuel vapors have dissipated.

Checking the Engine-Oil Level

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

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

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

- API Classification Level Required: CH-4, CI-4 or higher
- Preferred oil: SAE 15W-40 (above 0 degrees F)
- Alternate oil: SAE 10W-30 or 5W-30 (all temperatures)

Toro Premium Engine oil is available from your distributor in either 15W-40 or 10W-30 viscosity.

1. Park the machine on a level surface, shut off the engine, set the parking brake, and remove the key from the ignition switch.
2. Open the hood.
3. Remove the dipstick, wipe it clean, and install it ([Figure 29](#)).

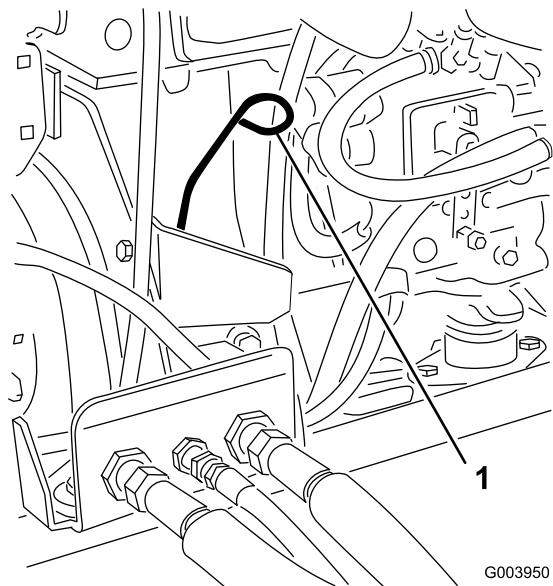


Figure 29

1. Dipstick

4. Remove the dipstick and check the oil level on the dipstick.

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

5. If the oil level is below the Full mark, remove the fill cap ([Figure 30](#)), and add oil until the level reaches the Full mark on dipstick.

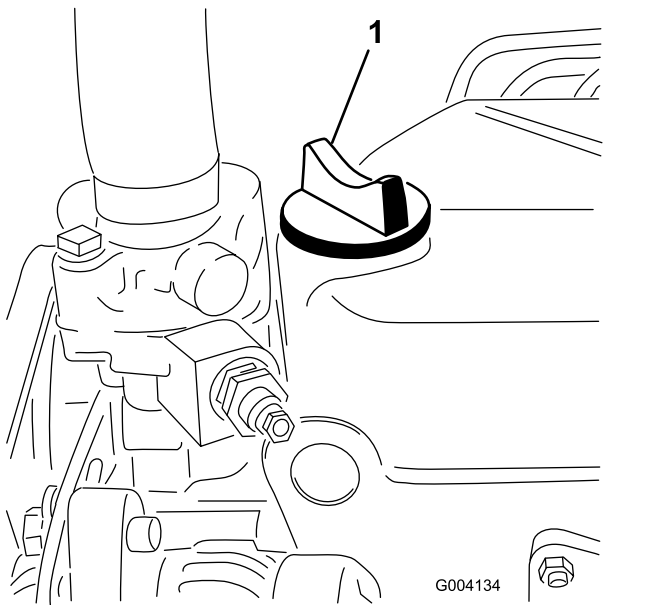


Figure 30

1. Oil-fill cap

Important: Do not overfill. Be sure to keep the engine-oil level between the upper and lower limits on the oil gauge. Engine failure may occur as a result of over filling or under filling the engine oil.

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

Checking the Cooling System

Clean debris off the screen, oil cooler, and front of the radiator daily and more often if conditions are extremely dusty and dirty. Refer to the section on Removing Debris from the Cooling System in [Cooling System Maintenance \(page 45\)](#).

The cooling system is filled with a 50/50 solution of water and permanent ethylene glycol antifreeze. Check the level of coolant in the expansion tank at the beginning of each day before starting the engine. The capacity of the cooling system is 9.5 L (10.0 US qt).

⚠ CAUTION

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

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

1. Check the level of coolant in the expansion tank ([Figure 31](#)).

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

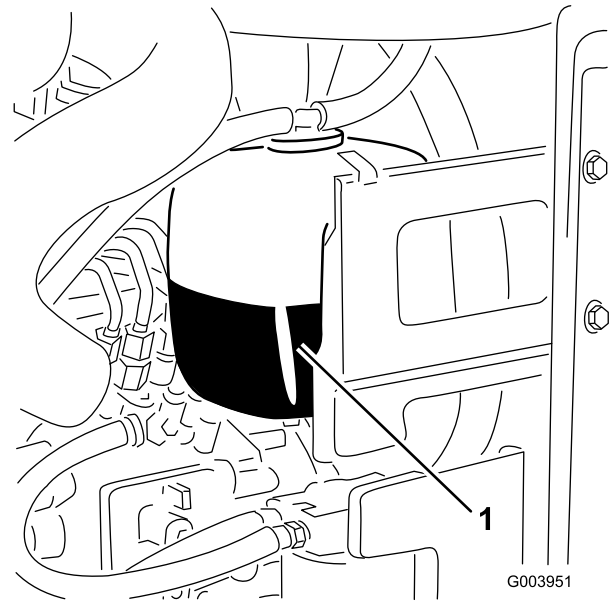


Figure 31

1. Expansion tank

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

Important: Do not overfill.

3. Install the expansion-tank cap.

Adding Fuel

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

Fuel tank capacity: 53 L (14 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 provides lower flash point and cold flow characteristics which eases starting and reduces fuel filter plugging.

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

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, 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 for more information on biodiesel.
1. Park the machine on a level surface, lower the cutting units, shut off the engine, and remove the key.
 2. Using a clean rag, clean the area around the fuel-tank cap.
 3. Remove the cap from the fuel tank (Figure 32).

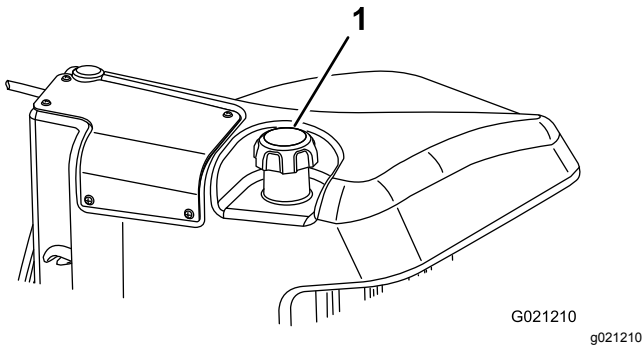


Figure 32

1. Fuel-tank cap

4. Fill the tank with fuel until the level is to the bottom of the filler neck.
5. Install the fuel-tank cap tightly after filling the tank.

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

Checking the Hydraulic Fluid

The machine's reservoir is filled at the factory with approximately 56.7 L (15 US gallons) of high quality

hydraulic fluid. Check the level of the hydraulic fluid before the engine is first started and daily thereafter. The recommended replacement fluid is as follows:

Toro Premium All Season Hydraulic Fluid (Available in 19 L (5 US gallon) pails or 208 L (55 US gallon) drums. See the *Parts Catalog* or your authorized Toro distributor for part numbers.)

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

Note: Toro does not assume responsibility for damage caused by improper substitutions, so use 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	cSt @ 40°C 44 to 50
	cSt @ 100°C 7.9 to 8.5
Viscosity Index ASTM D2270	140 to 160
Pour Point, ASTM D97	-36.6°C (-34°F) to 9.4°C (-49°F)

Industry Specifications:

Vickers I-286-S (Quality Level), Vickers M-2950-S (Quality Level), Denison HF-0

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 19 L (5 US gallon) containers or 208 L (55 US 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 Part No. 44-2500 from your authorized Toro distributor. This red dye is not

recommended for use with biodegradable fluids.
Use food coloring.

1. Park the machine on a level surface, lower the cutting units, shut off the engine, and remove the key.
2. Clean the area around the filler neck and cap of the hydraulic tank (Figure 33).

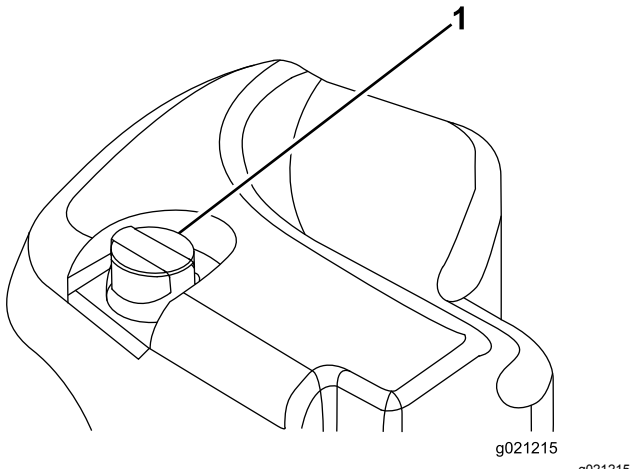


Figure 33

1. Hydraulic-tank cap

3. Remove the cap/dipstick from the filler neck and wipe it with a clean rag.
4. Insert the dipstick into the filler neck; then remove it and check level of fluid.

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

5. If the level is low, add appropriate fluid to raise level to the Full mark.

Important: Do not overfill.

6. Install the cap/dipstick onto the filler neck.

Checking the Reel-to-Bedknife Contact

Each day before operating, check the reel-to-bedknife contact, regardless of whether the quality of cut had previously been acceptable. There must be light contact across the full length of the reel and the bedknife; refer to Adjusting the Reel to Bedknife in the *Operator's Manual* of the cutting unit.

Checking the Torque of the Wheel Nuts

Torque the wheel nuts to 94 to 122 N·m (70 to 90 ft-lb) after 1 to 4 hours of operation and again after

10 hours of operation. Torque every 250 hours thereafter.

⚠ WARNING

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

Maintain the proper torque on the wheel nuts.

Breaking in the Machine

To ensure optimum performance of the parking-brake system, burnish (break in) the brakes before use. Set the forward traction speed to 4 mph to match the reverse traction speed. (All 8 spacers moved to the top of the mow-speed control.) With the engine at high idle, proceed forward with the mow-speed-control stop engaged and ride the brake for 15 seconds. Proceed backward at full reverse speed and ride the brake for 15 seconds. Repeat this 5 times, waiting 1 minute between each forward and reverse cycle to avoid overheating the brakes. An adjustment to the brakes may be required after break-in; refer to [Adjusting the Parking Brakes](#) (page 46).

Bleeding the Fuel System

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

- Initial start up of a new machine.
- Engine has ceased running due to lack of fuel.
- Maintenance has been performed upon fuel system components; i.e., filter replaced, separator serviced, etc.

⚠ DANGER

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

- Use a funnel and fill the fuel tank outdoors, in an open area, when the engine is off and is cold. Wipe up any fuel that spills.
- Do not fill the fuel tank completely full. Add fuel to the fuel tank until the level is 6 to 13 mm (1/4 to 1/2 inch) below the bottom of the filler neck. This empty space in the tank allows the fuel to expand.
- Never smoke when handling fuel, and stay away from an open flame or where fuel fumes may be ignited by a spark.
- Store fuel in a clean, safety-approved container and keep the cap in place.

1. Park the machine on a level surface and ensure that the fuel tank is at least half full.
2. Open the hood.
3. Open the air-bleed screw on the fuel-injection pump (Figure 34) with a 12 mm wrench.

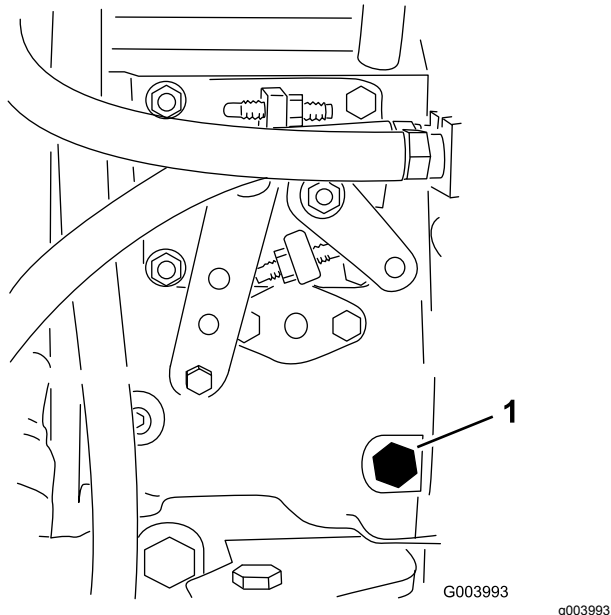


Figure 34

1. Bleed screw

4. Turn the key in the ignition switch to the ON position.

Note: The electric fuel pump begins to operate, thereby forcing air out around the air-bleed screw. Leave the key in the ON position until a solid stream of fuel flows out around the screw.

5. Tighten the screw and turn the key to the OFF position.

Note: Normally, the engine should start after the above bleeding procedures are followed. However, if the engine does not start, air may be trapped between injection pump and injectors; refer to [Bleeding Air from the Fuel Injectors](#) (page 43).

During Operation Safety

General Safety

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

Rollover Protection System (ROPS) Safety

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

Machines with a Fixed Roll Bar

- The ROPS is an integral safety device.
- Always wear your seat belt.

Slope Safety

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

- Identify hazards at the base of the slope. If there are hazards, mow the slope with a pedestrian-controlled machine.
- If possible, keep the cutting unit(s) lowered to the ground while operating on slopes. Raising the cutting unit(s) while operating on slopes can cause the machine to become unstable.
- Use extreme caution with grass collection systems or other attachments. These can change the stability of the machine and cause a loss of control.

Starting and Shutting Off the Engine

Important: You must bleed the fuel system before starting the engine if you are starting the engine for the first time, the engine has stopped due to lack of fuel, or you have performed maintenance on the fuel system; refer to [Bleeding the Fuel System \(page 27\)](#).

Starting the Engine

1. Sit on the seat, keep your foot off the traction pedal so that it is in the NEUTRAL position, engage the parking brake, set the throttle to the FAST position, and ensure that the Enable/Disable switch is in the DISABLE position.
2. Turn the ignition switch to the ON/PREHEAT position.

Note: An automatic timer will control the glow plug preheat for 6 seconds.

3. After preheating the glow plugs, turn key to the START position.

Important: Crank the engine for no longer than 15 seconds. Release the key when the engine starts. If additional preheating is required, turn key to the OFF position and then to the ON/PREHEAT position. Repeat this process as required.

4. Run the engine at low idle speed until it warms up.

Shutting Off the Engine

1. Move all controls to NEUTRAL, engage the parking brake, move the throttle to the LOW IDLE position and allow the engine to reach low idle speed.

Important: Allow the engine to idle for 5 minutes before shutting it off after a full load operation. Failure to do so may lead to trouble on a turbo-charged engine.

- Turn the key to the OFF position and remove it from the switch.

Setting the Reel Speed

To achieve a consistent, high quality of cut and a uniform after-cut appearance, it is important that you set the reel speed to the proper setting. Adjust the reel speed as follows:

- In the InfoCenter, under the settings menu, enter the blade count, mow speed and HOC to calculate the proper reel speed.
- If further adjustments are required, in the settings menu, scroll down to the F Reel RPM, R Reel RPM or both.
- Press the right button to change the reel speed value. As the speed setting is changed, the display will continue to show the calculated reel speed based on blade count, mow speed and HOC, but the new value will also be displayed.

Note: You may need to increase or decrease the reel speed to compensate for varying turf conditions.

Adjusting the Lift-Arm Counterbalance

You can adjust the counterbalance on the rear cutting-unit lift arms to compensate for different turf conditions and to maintain a uniform height of cut in the rough conditions or in areas of thatch buildup.

You can adjust each counterbalance spring to 1 of 4 settings. Each increment increases or decreases counterbalance on the cutting unit by 2.3 kg (5 lb). You can position the springs on the back side of the first spring actuator to remove all counter balance (fourth position).

- Park the machine on a level surface, lower the cutting units, engage the parking brake, shut off the engine, and remove the key.
- Insert a tube or similar object onto the long spring end and pivot it around the spring actuator to the desired position (Figure 35).

⚠ CAUTION

The springs are under tension and could cause personal injury.

Use caution when adjusting the springs.

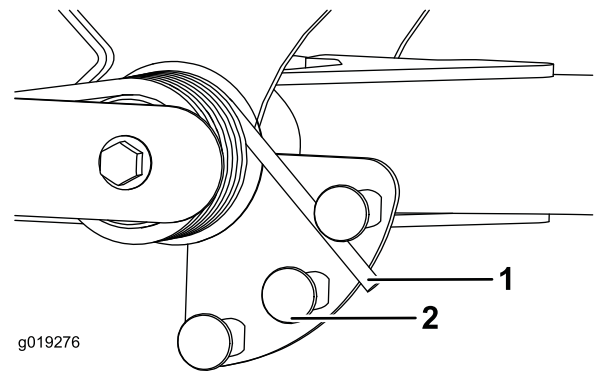


Figure 35

- Spring
- Spring actuator

- Repeat the procedure on the other spring.

Adjusting the Lift-Arm Turnaround Position

- Park the machine on a level surface, lower the cutting units, engage the parking brake, shut off the engine, and remove the key.
- The lift-arm switch is located underneath the hydraulic tank behind the front, right lift arm (Figure 36).
- Loosen the switch-mounting screws and move the switch down to increase the lift-arm turnaround height or move the switch up to decrease the lift-arm turnaround height (Figure 36).

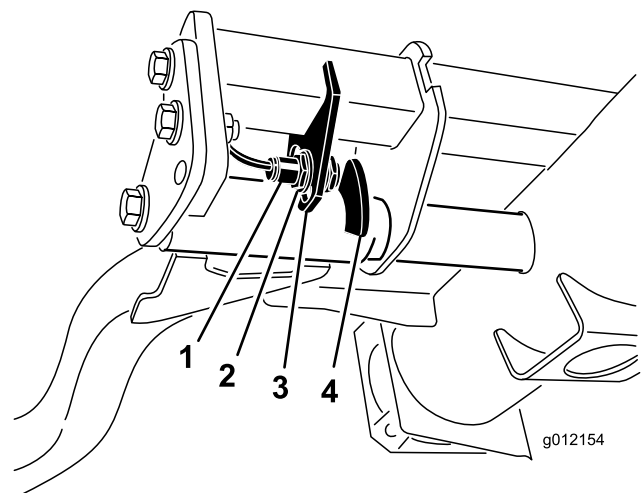


Figure 36

- Switch
- Lift-arm sensing device

- Tighten the mounting screws.

Pushing or Towing the Machine

In an emergency, the machine can be moved by actuating the bypass valve in the variable displacement hydraulic pump and 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. The bypass valve must be open whenever you push or tow the machine.

1. The bypass valve is located on the left side of the hydrostat (Figure 37). Rotate the bolt 1-1/2 turns to open and allow fluid to bypass internally.

Note: You can now move the machine slowly without damaging the transmission.

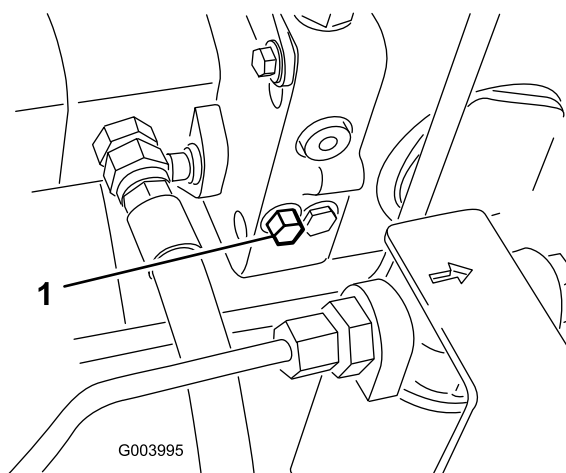


Figure 37

1. Bypass valve

2. Close the bypass valve before starting the engine. However, do not exceed 7 to 11 N·m. (5 to 8 ft·lb) torque to close the valve.

Important: Running the engine with the bypass valve open causes the transmission to overheat.

Understanding the Diagnostic Light

The machine is equipped with a diagnostic light which indicates if the electronic controller senses an electronic malfunction. The diagnostic light is located on the control arm (Figure 38). When the machine is functioning properly and the key switch is moved to the ON/RUN position, the diagnostic light turns on briefly to indicate the light is working properly. When a machine advisory message is displayed, the light illuminates when the message is present. When a fault message is displayed, the light blinks until the fault is resolved.

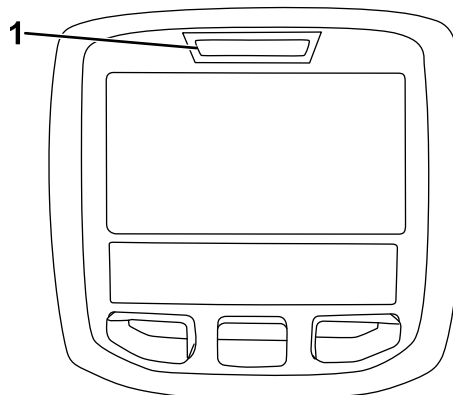


Figure 38

1. Diagnostic light

Checking the Interlock Switches

The purpose of the interlock switches is to prevent the engine from cranking or starting unless the traction pedal is in the NEUTRAL position, the Enable/Disable switch is in the DISABLE position, and the Lower Mow/Raise control is in the NEUTRAL position. In addition, the engine should shut off when you press the traction pedal while you are off the seat or if you leave the parking brake engaged.

⚠ CAUTION

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

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

Verifying the Interlock Switch Function

1. Park the machine on a level surface, lower the cutting units, shut off the engine, and engage the parking brake.
2. Turn the key switch to the ON position, but do not start the machine.
3. Locate the appropriate switch function in the diagnostics menu on the InfoCenter.
4. Individually, change each of the switches from open to closed (i.e., sit on seat, engage traction pedal, etc.), and note that the appropriate state of the switch changes. Repeat this for all switches that you can change by hand.
5. If a switch is closed and the appropriate indicator does not change, check all wiring and connections to the switch and/or check the switches with an ohm meter. Replace any defective switches and repair any defective wiring.

Note: The InfoCenter display also has the ability to detect which output solenoids or relays are turned on. This is a quick way to determine if a machine malfunction is electrical or hydraulic.

Verifying Output Function

1. Park the machine on a level surface, lower the cutting units, shut off the engine, and engage the parking brake.
2. Turn the key switch to the ON position and start the machine.
3. Locate the appropriate output function in the diagnostics menu on the InfoCenter.
4. Sit on the seat and attempt to operate the desired function of the machine. The appropriate outputs should change state to indicate that the ECM is turning on that function.

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

If the output displays are on as specified, but the machine does not function properly, this indicates a non-electrical problem. Repair as necessary.

After Operation Safety

- Clean grass and debris from the cutting units, mufflers, and engine compartment to help prevent fires. Clean up oil or fuel spills.
- If the cutting units are in the transport position, use the positive mechanical lock (if available) before you leave the machine unattended.

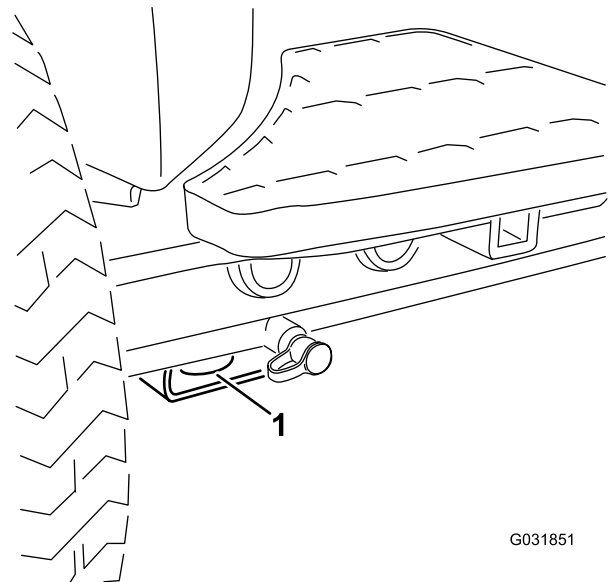
- Allow the engine to cool before storing the machine in any enclosure.
- Shut off the fuel before storing or transporting the machine.
- Never store the machine or fuel container where there is an open flame, spark, or pilot light, such as on a water heater or on other appliances.
- Keep all parts of the machine in good working condition and all hardware tightened, especially blade-attachment hardware.
- Replace all worn or damaged decals.

Hauling the Machine

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

Identifying the Tie-Down Points

- Front—the hole in the rectangular pad, under the axle tube, inside each front tire (Figure 39)



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Figure 39

1. Front tie-down

- Rear—each side of the machine on the rear frame (Figure 40)

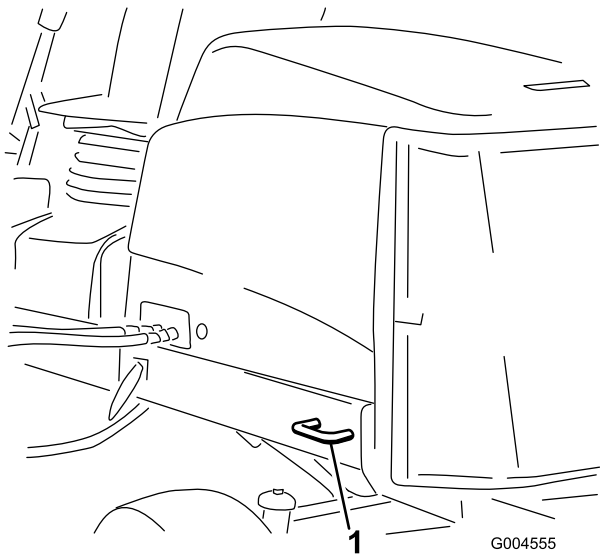


Figure 40

1. Rear tie-down

Jacking Points

Note: Use jack stands to support the machine when required.

- Front—rectangular pad, under the axle tube, inside each front tire (Figure 41).

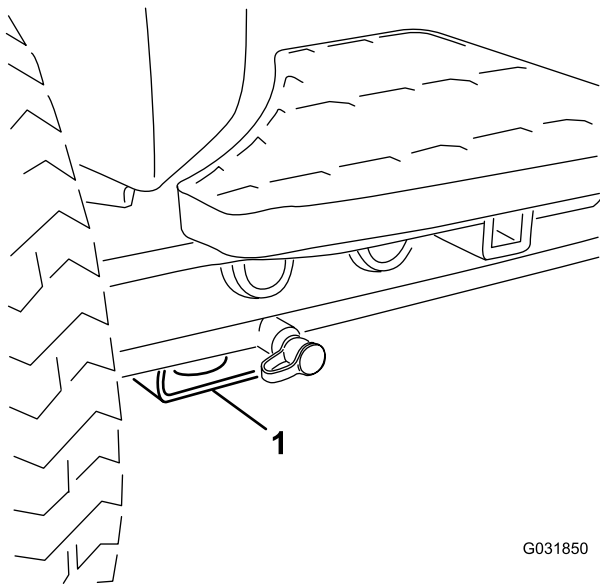


Figure 41

1. Front jacking point

- Rear—rectangular axle tube on the rear axle.

Hydraulic Valve Solenoid Functions

Use the list below to identify and describe the different functions of the solenoids in the hydraulic manifold. Each solenoid must be energized to allow function to occur.

Solenoid	Function
MSV2	Front reel circuit
MSV1	Rear reel circuit
SVRV	Lift/lower cutting units
SV1	Lift/lower front cutting unit
SV3	Lift/lower rear cutting unit
SV2	Raise any cutting units

Operating Tips

Becoming Familiarized with the Machine

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

Understanding the Warning System

If a warning light comes on during operation, stop the machine immediately and correct the problem before continuing operation. Serious damage could occur if you operate the machine with a malfunction.

Mowing

Start the engine and move the engine-speed switch to the FAST position. Move the Enable/Disable switch to the ENABLE position and use the Lower Mow/Raise lever to control the cutting units (the front cutting units are timed to lower before the rear cutting units). To move forward and cut grass, press the traction pedal forward.

Transporting the Machine

Move the Enable/Disable switch to the DISABLE position and raise the cutting units to the TRANSPORT position. Move the Mow/Transport lever to the TRANSPORT position. Be careful when driving between objects so you do not accidentally damage the machine or cutting units. Use extra care when

operating the machine on slopes. Drive slowly and avoid sharp turns on slopes to prevent rollovers. Lower the cutting units when going downhill for steering control.

Maintenance

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

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first hour	<ul style="list-style-type: none"> • Torque the wheel lug nuts to 94 to 122 N·m (70 to 90 ft-lb).
After the first 8 hours	<ul style="list-style-type: none"> • Check the condition and tension of the alternator belt.
After the first 10 hours	<ul style="list-style-type: none"> • Torque the wheel lug nuts to 94 to 122 N·m (70 to 90 ft-lb).
After the first 50 hours	<ul style="list-style-type: none"> • Change the engine oil and filter. • Check the engine rpm speed (idle and full throttle).
Before each use or daily	<ul style="list-style-type: none"> • Check the engine-oil level. • Check the cooling system. • Check the hydraulic fluid level. • Check the reel to bedknife contact. • Check the operation of the interlock switches. • Drain water or other contaminants from water separator . • Remove debris from the screen, oil coolers, and radiator (more frequently in dirty operating conditions). • Check the hydraulic lines and hoses for leaks, kinked lines, loose mounting supports, wear, loose fittings, weather deterioration, and chemical deterioration.
Every 50 hours	<ul style="list-style-type: none"> • Grease the bearings and bushings. (Grease them immediately after every washing regardless of the interval listed.) • Clean the battery and check the condition of it (or weekly, whichever comes first). • Check the battery-cable connections.
Every 100 hours	<ul style="list-style-type: none"> • Inspect the cooling system hoses. • Check the condition and tension of the alternator belt.
Every 150 hours	<ul style="list-style-type: none"> • Change the engine oil and filter.
Every 200 hours	<ul style="list-style-type: none"> • Drain moisture from the fuel and hydraulic fluid tanks. • Check the reel bearing preload.
Every 250 hours	<ul style="list-style-type: none"> • Torque the wheel lug nuts to 94 to 122 N·m (70 to 90 ft-lb).
Every 400 hours	<ul style="list-style-type: none"> • Service the air cleaner. (Service the air cleaner earlier if the air-cleaner indicator shows red. Service it more frequently in extremely dirty or dusty conditions.) • Check the fuel lines and connections for deterioration, damage, or loose connections. • Replace the fuel filter canister. • Check the engine rpm speed (idle and full throttle).
Every 800 hours	<ul style="list-style-type: none"> • Drain and clean the fuel tank. • Check the rear wheel toe-in. • Change the hydraulic fluid. • Change the hydraulic filters (sooner if the service interval indicator is in the Red zone). • Pack the rear wheel bearings. • Adjust the engine valves (refer to the engine owner's manual).
Before storage	<ul style="list-style-type: none"> • Drain and clean the fuel tank.
Every 2 years	<ul style="list-style-type: none"> • Flush and replace the cooling system fluid. • Drain and flush the hydraulic tank. • Replace all moving hoses.

Daily Maintenance Checklist

Duplicate this page for routine use.

Maintenance Check Item	For the week of:						
	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
Check the safety interlock operation.							
Check the brake operation.							
Check the engine oil and fuel level.							
Drain the water/fuel separator.							
Check the air filter restriction indicator.							
Check the radiator and screen for debris.							
Check unusual engine noises. ¹							
Check unusual operating noises.							
Check the hydraulic system fluid level.							
Check the hydraulic filter indicator. ²							
Check hydraulic hoses for damage.							
Check for fluid leaks.							
Check the tire pressure.							
Check the instrument operation.							
Check the reel-to-bedknife adjustment.							
Check the height-of-cut adjustment.							
Check all grease fittings for lubrication. ³							
Touch-up damaged paint.							
<p>1. Check the glow plug and injector nozzles if hard starting, excess smoke, or rough running is noted.</p> <p>2. Check with the engine running and the oil at operating temperature</p> <p>3. Immediately after every washing, regardless of the interval listed</p>							

Notation for Areas of Concern

Inspection performed by:		
Item	Date	Information
1		
2		
3		
4		
5		
6		
7		
8		

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

Note: To obtain an electrical schematic or a hydraulic schematic for your machine, visit www.Toro.com.

Service Interval Chart

REELMASTER 5010-H/ 5410/5510/5610 & GROUNDMASTER 4300
QUICK REFERENCE AID

CHECK/SERVICE (daily)

1. OIL LEVEL, ENGINE
2. OIL LEVEL, HYDRAULIC TANK
3. COOLANT LEVEL, RADIATOR
4. FUEL /WATER SEPARATOR
5. PRECLEANER – AIR CLEANER
6. RADIATOR SCREEN
7. BRAKE FUNCTION
8. TIRE PRESSURE
9. BELTS (FAN, ALT.)

GREASING -- SEE OPERATOR'S MANUAL

FLUID SPECIFICATIONS/CHANGE INTERVALS

SEE OPERATOR'S MANUAL FOR INITIAL CHANGES.	FLUID TYPE	CAPACITY	CHANGE INTERVAL		FILTER PART NO.
			FLUID	FILTER	
A. ENGINE OIL	SAE 15W-40CI-4	3.5 QTS* (5010-H) 5.5 QTS.*	150 HRS.	150 HRS.	104-5167
B. HYD. CIRCUIT OIL	ISO VG 46/68	11 GALS.* (5010-H) 15 GALS.*	800 HRS.	SEE INDICATOR 800 HRS.	94-2621** 86-2010
C. AIR CLEANER				SEE INDICATOR	108-3810 (5010-H) (5410) (5510)
D. WATER SEPARATOR				400 HRS.	108-3812 (5610) (4300)
E. FUEL TANK	NO. 2-DIESEL	14 GALS.	DRAIN AND FLUSH, 2 YRS.		
F. COOLANT	50/50 ETHYLENE GLYCOL/WATER	5.5 QTS. (5010-H) 7.0 QTS. (5410) (5510) 10.0 QTS. (5610) (4300)	DRAIN AND FLUSH, 2 YRS.		

* INCLUDING FILTER ** EXCLUDES 5010-H

Figure 42

decal125-8753

CAUTION

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

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

Pre-Maintenance Procedures

Pre-Maintenance Safety

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

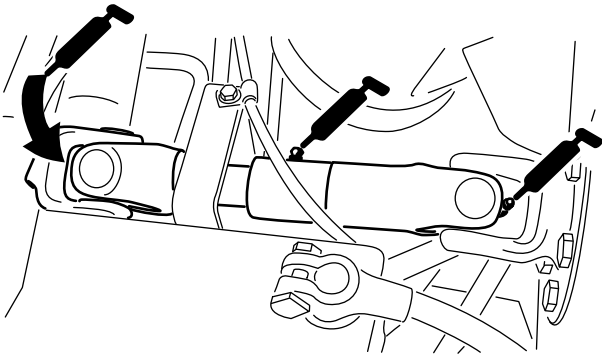
Lubrication

Greasing the Bearings and Bushings

If you operate the machine under normal conditions, lubricate all grease fittings for the bearings and bushings after **every 50 hours of operation** with No. 2 lithium grease. Lubricate the bearings and bushings **immediately** after every washing, regardless of the interval listed.

The grease fitting locations and quantities are as follows:

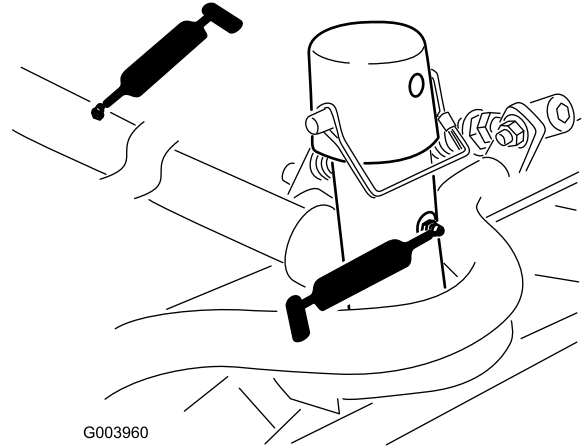
- Pump drive shaft U-joint (3) (Figure 43)



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Figure 43

- Lift-arm pivots (1 each) (Figure 44)
- Cutting unit carrier frame and pivot (2 each) (Figure 45)

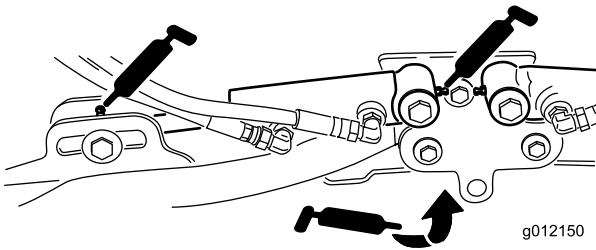


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Figure 45

- Cutting unit lift-arm cylinders (2 each) (Figure 44)

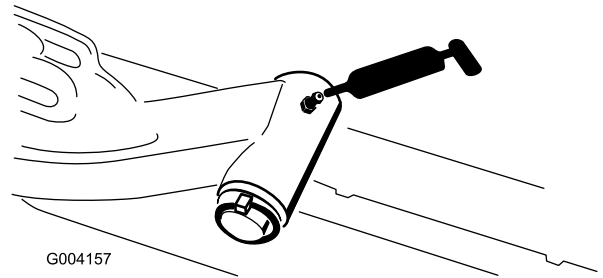


g012150

g012150

Figure 44

- Lift-arm-pivot shaft (1 each) (Figure 46)



G004157

g004157

Figure 46

- Rear axle-tie rod (2) (Figure 47)

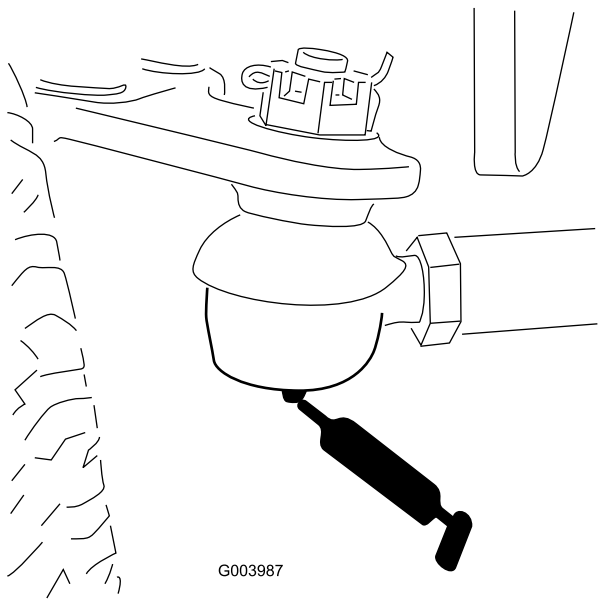


Figure 47

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- Axle steering pivot (1) (Figure 48)

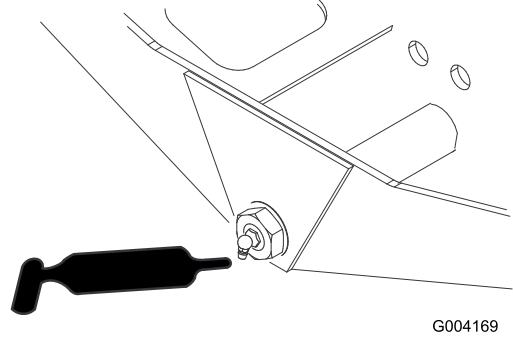


Figure 48

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- Steering-cylinder-ball joints (2) (Figure 49)

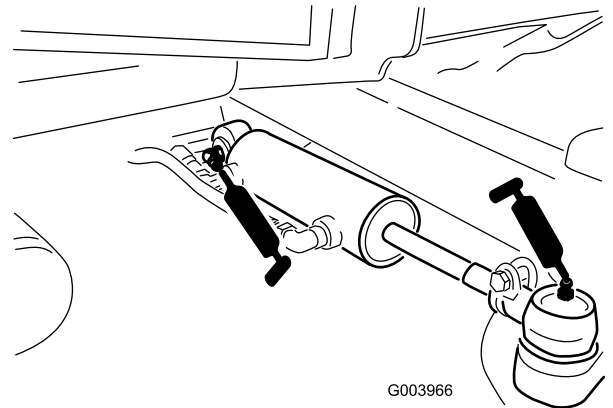


Figure 49

g003966

- Brake pedal (1) (Figure 50)

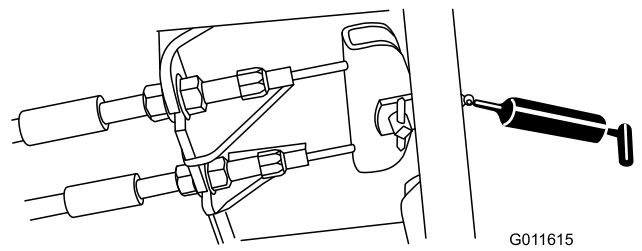


Figure 50

g011615

Engine Maintenance

Engine Safety

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

Servicing the Air Cleaner

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

Service the air cleaner filter only when the service indicator (Figure 51) requires it. Changing the air filter before it is necessary only increases the chance of dirt entering the engine when the filter is removed.

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

1. Release the latches securing the air-cleaner cover to the air-cleaner body (Figure 51).

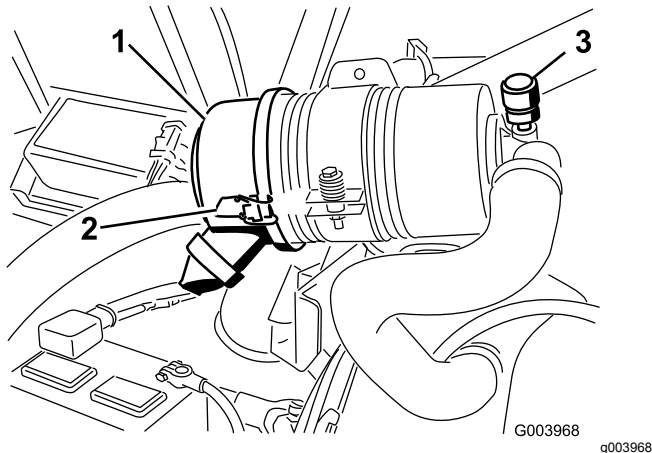


Figure 51

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

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

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

3. Remove and replace the filter (Figure 52).

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

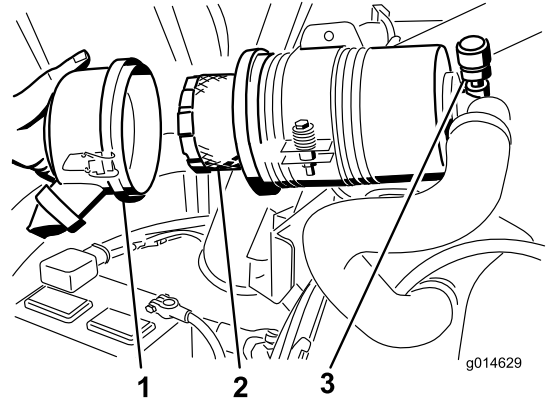


Figure 52

1. Air-cleaner cover
2. Air-cleaner filter
3. Air-cleaner indicator

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

Servicing the Engine Oil and Filter

Change the engine oil and filter initially after the first 50 hours of operation and every 150 hours thereafter.

1. Remove the drain plug (Figure 53) and let the oil flow into a drain pan.

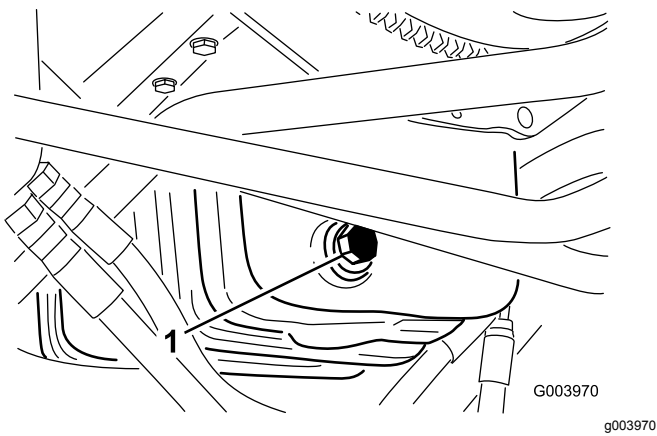


Figure 53

1. Oil drain plug

2. When the oil stops, install the drain plug.
3. Remove the oil filter (Figure 54).

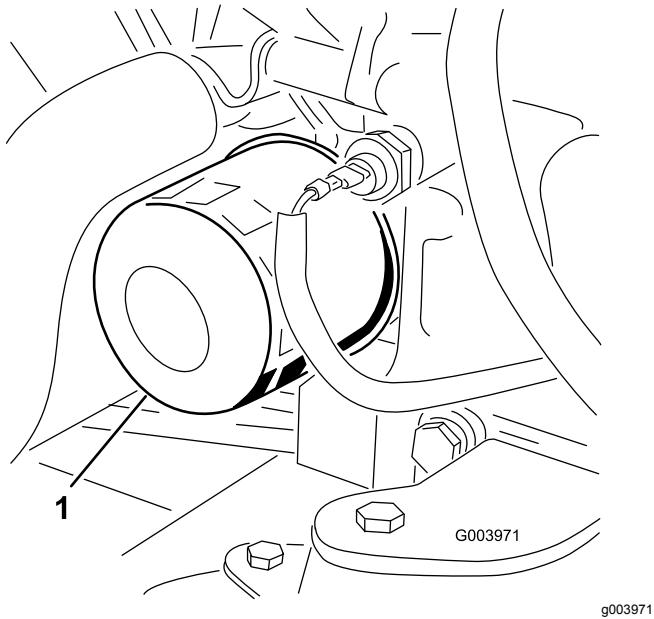


Figure 54

1. Oil filter

4. Apply a light coat of clean oil to the new filter seal.
5. Install the replacement oil filter to the filter adapter. Turn the oil filter clockwise until the rubber gasket contacts the filter adapter, then tighten the filter an additional 1/2 turn.

Important: Do not over-tighten the filter.

6. Add oil to the crankcase; refer to [Checking the Engine-Oil Level \(page 24\)](#).

Adjusting the Throttle

1. Position the throttle lever forward so it is approximately 3 mm (1/8 inch) from the front of the control arm slot.
2. Loosen the throttle cable connector, on the throttle cable, next to the injection-pump lever (Figure 55).

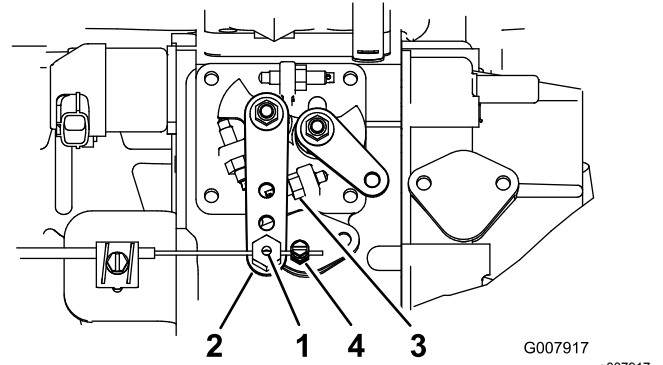


Figure 55

1. Throttle-cable pivot
2. Injection-pump-lever arm
3. High-idle stop
4. Throttle-cable connector

3. Hold the injection-pump-lever arm against the high-idle stop (Figure 55).
4. While pulling the throttle cable, tighten the throttle-cable connector to remove any slack.

Note: When tightened, the cable pivot must be free to swivel on the injection-pump-lever arm.

5. If the throttle does not stay in position during operation, increase the torque on the locknut used to set the friction device on the throttle lever.

Fuel System Maintenance

⚠ DANGER

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

- Use a funnel and fill the fuel tank outdoors, in an open area, when the engine is off and is cold. Wipe up any fuel that spills.
- Do not fill the fuel tank completely full. Add fuel to the fuel tank until the level is 6 to 13 mm (1/4 to 1/2 inch) below the bottom of the filler neck. This empty space in the tank allows the fuel to expand.
- Never smoke when handling fuel, and stay away from an open flame or where fuel fumes may be ignited by a spark.
- Store fuel in a clean, safety-approved container and keep the cap in place.

Draining the Fuel Tank

Service Interval: Every 800 hours

Before storage

Drain and clean the fuel tank if the fuel system becomes contaminated or if the machine is to be stored for an extended period. Use clean fuel to flush out the tank.

Checking the Fuel Lines and Connections

Check the fuel lines and connections every 400 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

Every 400 hours

1. Place a clean container under the fuel filter (Figure 56).
2. Loosen the drain plug on the bottom of the filter canister.

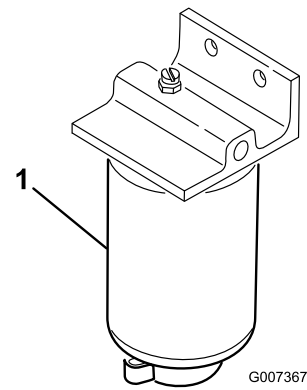


Figure 56

g007367

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

Servicing the Fuel Pick-up Tube Screen

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

Bleeding Air from the Fuel Injectors

Note: This procedure should be used only if the fuel system has been purged of air through normal priming procedures and the engine does not start; refer to [Bleeding the Fuel System \(page 27\)](#).

1. Loosen the pipe connection to the No. 1 nozzle and holder assembly ([Figure 57](#)).

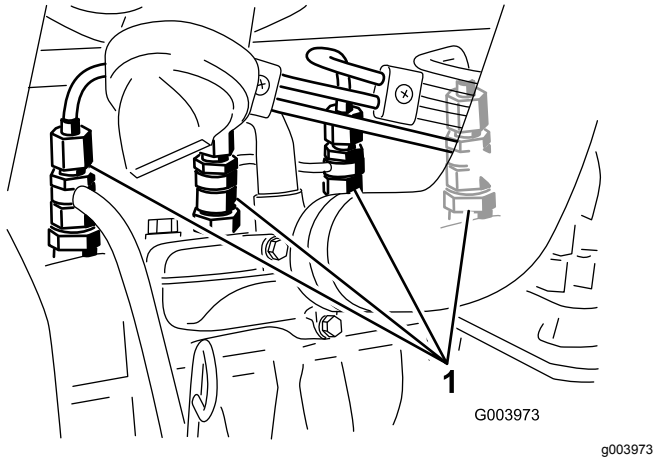


Figure 57

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

Electrical System Maintenance

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

Electrical System Safety

- Disconnect the battery before repairing the machine. Disconnect the negative terminal first and the positive last. Connect the positive terminal first and the negative last.
- Charge the battery in an open, well-ventilated area, away from sparks and flames. Unplug the charger before connecting or disconnecting the battery. Wear protective clothing and use insulated tools.

Servicing the Battery

Service Interval: Every 50 hours—Clean the battery and check the condition of it (or weekly, whichever comes first).

Every 50 hours—Check the battery-cable connections.

⚠ DANGER

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

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

⚠ WARNING

Charging the battery produces gasses that can explode.

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

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

Checking the Fuses

There are 8 fuses in the electrical system. The fuse block is located behind the control-arm-access panel (Figure 58).

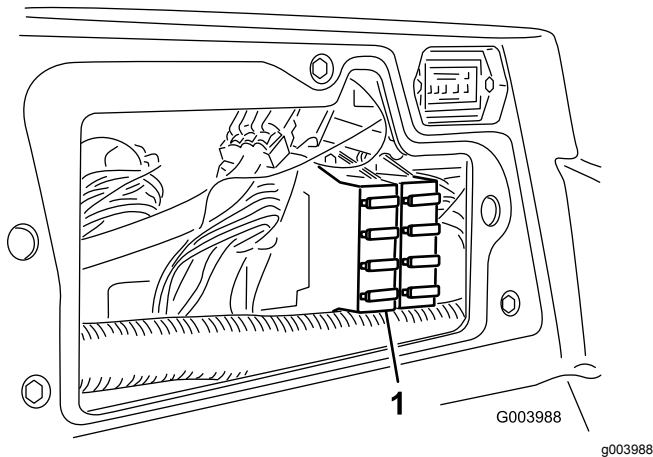


Figure 58

1. Fuse block

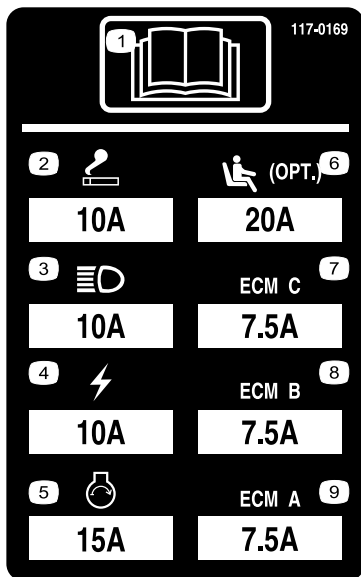


Figure 59

Drive System Maintenance

Adjusting the Traction Drive for Neutral

The machine must not creep when the traction pedal is released. If it does creep, adjust as follows:

1. Park the machine on a level surface, shut off the engine, and lower the cutting units to the floor.
2. Jack up the front of the machine until the front tires are off the shop floor. Support the machine with jack stands to prevent it from falling accidentally.

Note: On 4-wheel-drive models, the rear tires must also be off the shop floor

3. On the right side of the hydrostat, loosen the locknut on the traction adjustment cam (Figure 60).

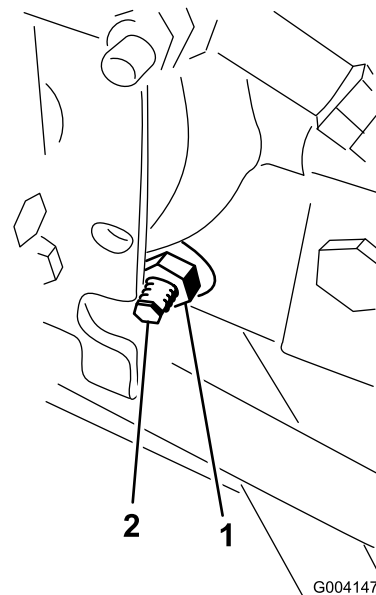


Figure 60

1. Locknut
2. Traction adjustment cam

⚠ WARNING

The engine must be running so the final adjustment of the traction adjustment cam can be performed. This could cause personal injury.

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

4. Start the engine and rotate the cam hex in either direction until the wheels cease rotation.
5. Tighten the locknut to secure the adjustment.
6. Shut off the engine. Remove the jack stands and lower the machine to the shop floor.
7. Test drive the machine to make sure it does not creep.

Adjusting the Rear Wheel Toe-in

1. Rotate the steering wheel so that the rear wheels are straight ahead.
2. Loosen the jam nut on each end of the tie rod (Figure 61).

Note: The end of the tie rod with the external groove is a left hand thread.

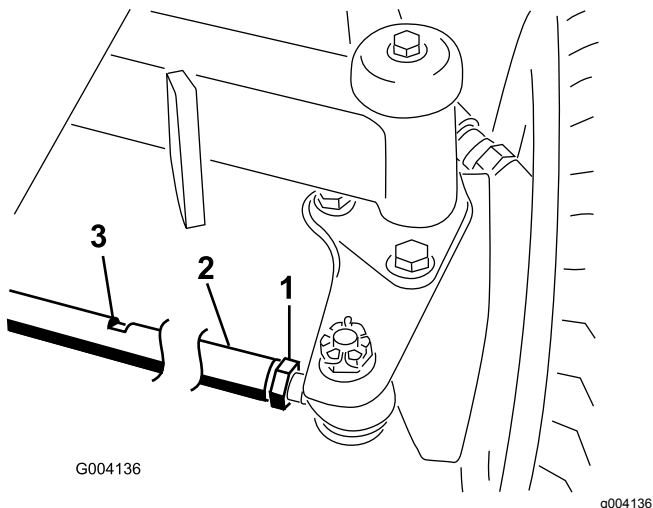


Figure 61

1. Jam nut
2. Tie rod
3. Wrench slot

3. Using the wrench slot, rotate the tie rod
4. Measure the distance at the front and rear of the rear wheels at axle height. The distance at the front of the rear wheels should be less than 6 mm (1/4 inch) of the distance measured at the rear of the wheels.
5. Repeat procedure as required.

Cooling System Maintenance

Cooling System Safety

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

Removing Debris from the Cooling System

1. Shut off the engine and remove the key from the ignition switch.
2. Thoroughly clean all debris out of the engine area.
3. Unlatch the clamp and pivot open the rear screen (Figure 62).

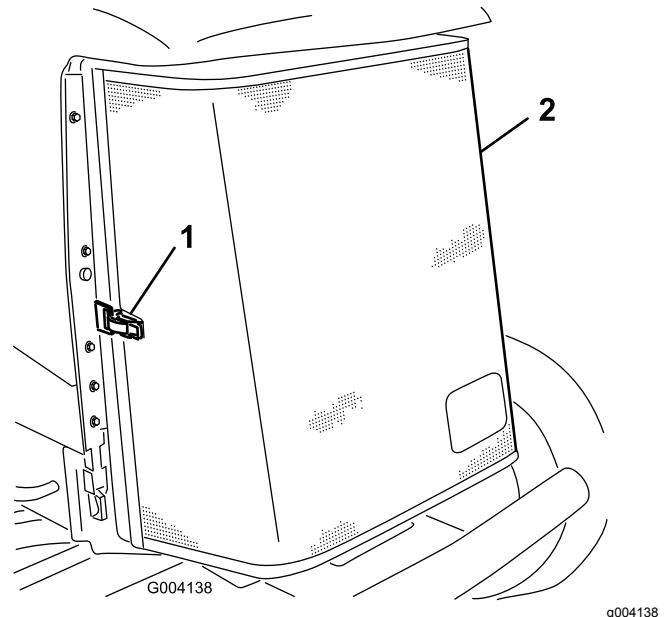


Figure 62

1. Rear-screen latch
2. Rear screen

4. Clean the screen thoroughly with compressed air.
5. Pivot the latches inward to release the oil cooler (Figure 63).

Brake Maintenance

Adjusting the Parking Brakes

Adjust the brakes when there is more than 2.5 cm (1 inch) of free travel ([Figure 65](#)) of the brake pedal, or when more holding force is required. Free travel is the distance the brake pedal moves before you feel braking resistance.

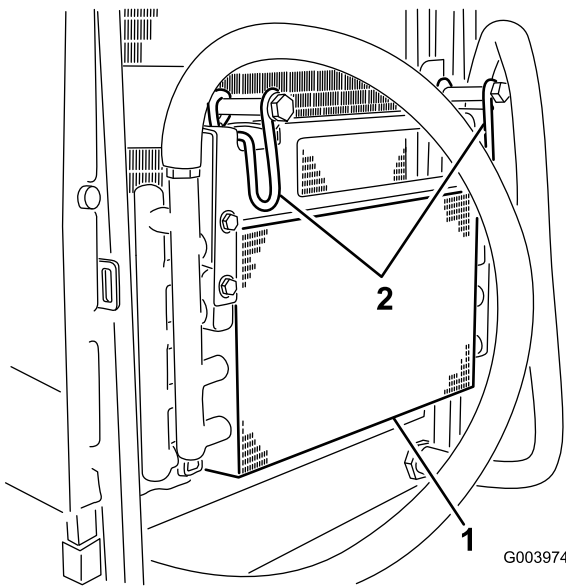


Figure 63

1. Oil cooler
2. Oil cooler latches

6. Thoroughly clean both sides of the oil cooler and the radiator ([Figure 64](#)) with compressed air.

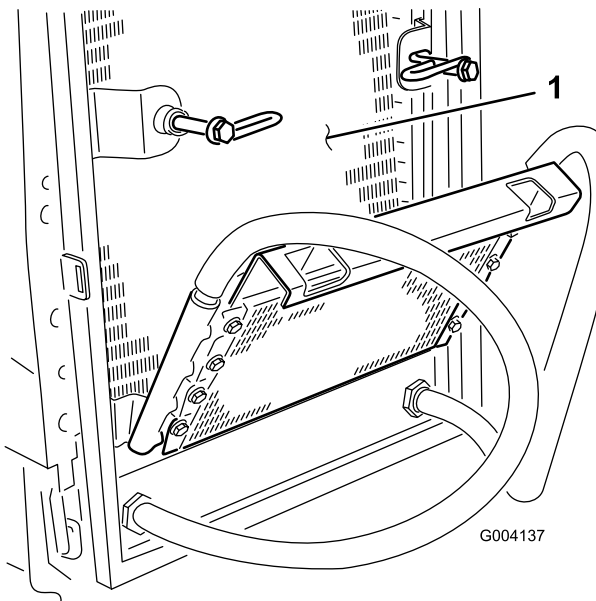


Figure 64

1. Radiator

7. Pivot the oil cooler back into position and secure the latches.
8. Close the screen and secure the latch.

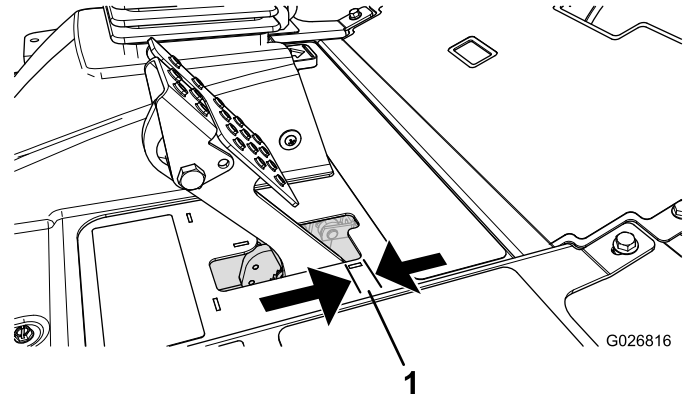


Figure 65

1. Free travel

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

1. To reduce free travel of the brake pedals, tighten the brakes by loosening the front nut on the threaded end of the brake cable ([Figure 66](#)).

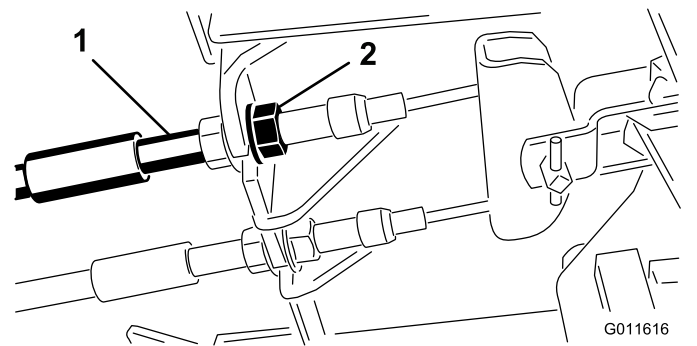


Figure 66

1. Brake cables
2. Front nuts

2. Tighten the rear nut to move the cable backward until brake pedals have 0.63 to 1.27 cm (1/4 to 1/2 inch) of free travel ([Figure 65](#)), before the wheels lock up.
3. Tighten the front nuts, ensuring that both cables actuate the brakes simultaneously.

Note: Ensure that the cable conduit does not rotate during the tightening procedure.

Adjusting the Parking-Brake Latch

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

1. Loosen the 2 screws securing the parking-brake pawl to the frame (Figure 67).

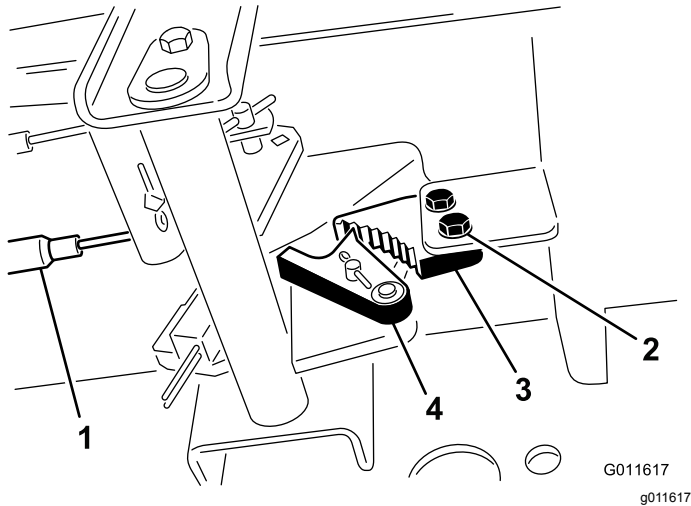


Figure 67

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

2. Press the parking-brake pedal forward until the brake detent completely engages on the brake pawl (Figure 67).
3. Tighten the 2 screws locking the adjustment.
4. Press the brake pedal to release the parking brake.
5. Check the adjustment and adjust as required.

Belt Maintenance

Check the condition and tension of the alternator belt after the first day of operation and every 100 operating hours thereafter.

Tensioning the Alternator Belt

1. Open the hood.
2. Check the tension of the alternator belt by depressing it (Figure 68) midway between the alternator and the crankshaft pulleys with 10 kg (22 lb) of force.

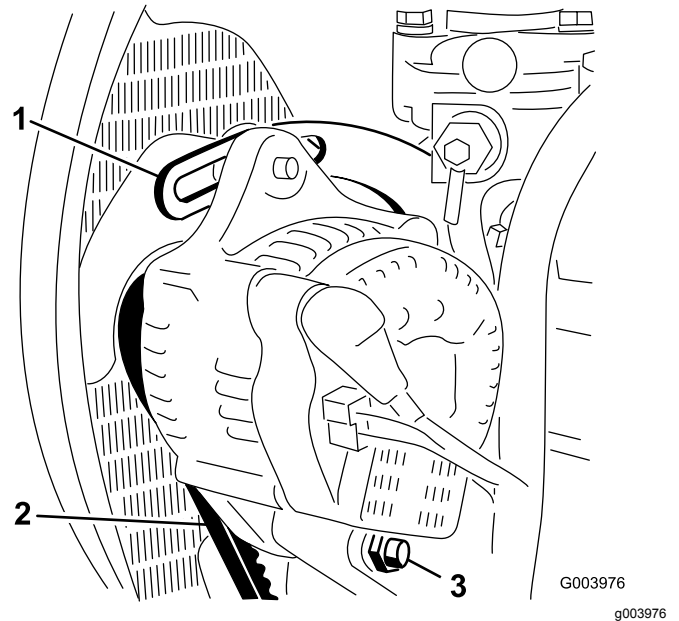


Figure 68

- | | |
|--------------------|---------------|
| 1. Brace | 3. Pivot bolt |
| 2. Alternator belt | |

The belt should deflect 11 mm (7/16 inch). If the deflection is incorrect, proceed to step 3. If correct, continue operation.

3. Loosen the bolt securing the brace to the engine (Figure 68), the bolt securing the alternator to the brace and the pivot bolt.
4. Insert a pry bar between the alternator and the engine and pry out on the alternator.
5. When you achieve the proper tension, tighten the alternator, brace and pivot bolts to secure the adjustment.

Hydraulic System Maintenance

Hydraulic System Safety

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

Changing the Hydraulic Fluid

Change hydraulic fluid after every 800 operating hours, in normal conditions. If 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.

1. Shut off the engine and raise the hood.
2. Place a large drain pan under the fitting secured to the bottom of the hydraulic-fluid reservoir (Figure 69).

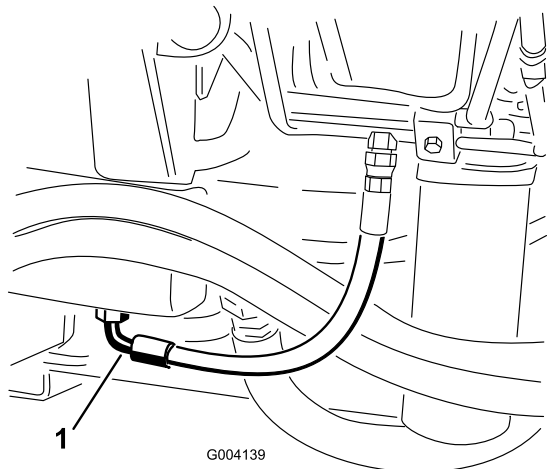


Figure 69

1. Hose

3. Disconnect the hose from the bottom of the fitting and let the hydraulic fluid flow into the drain pan.

4. Install the hose when hydraulic fluid stops draining.
5. Fill the reservoir with approximately 56.7 L (15 US gallons) of hydraulic fluid; refer to [Checking the Hydraulic Fluid \(page 26\)](#).

Important: Use only hydraulic fluids specified. Other fluids could cause system damage.

6. Install the reservoir cap.
7. Start the engine and use all of the hydraulic controls to distribute hydraulic fluid throughout the system. Also check for leaks.
8. Shut off the engine.
9. Check the level of the hydraulic fluid and add enough to raise level to the Full mark on the dipstick.

Important: Do not over-fill.

Replacing the Hydraulic Filters

The hydraulic system is equipped with a service interval indicator (Figure 70). With the engine running at operating temperature, view the indicator, it should be in the green zone. When the indicator is in the red zone, change the hydraulic filters.

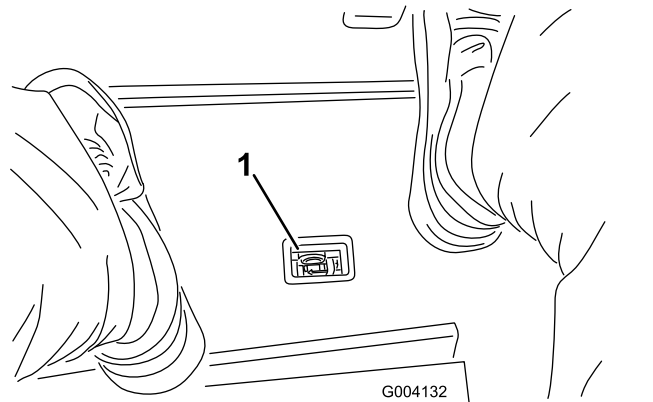


Figure 70

1. Hydraulic filter restriction indicator

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

1. Position the machine on a level surface, lower the cutting units, shut off the engine, engage the parking brake, and remove the key from the ignition switch.
2. Clean the area around the filter mounting area and place a drain pan under the filter (Figure 71) and (Figure 72).

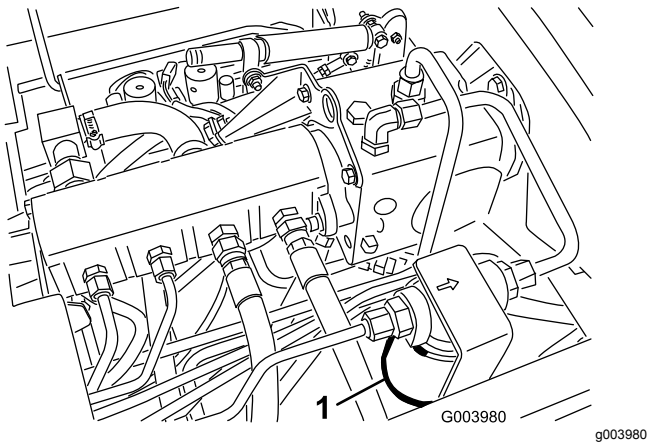


Figure 71

1. Hydraulic filter

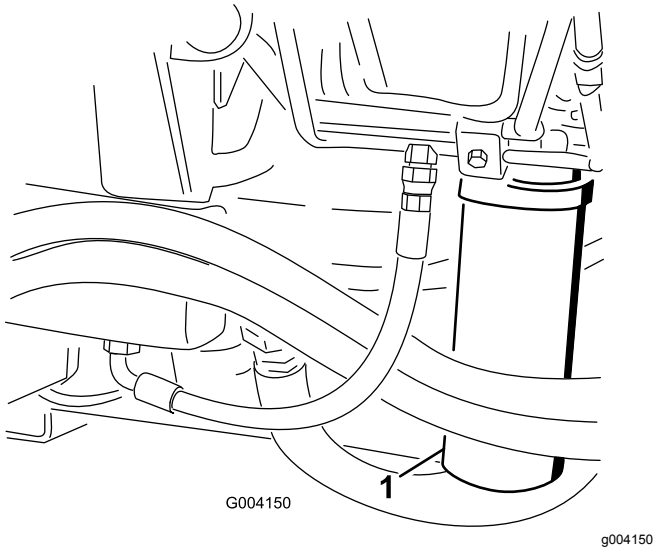


Figure 72

1. Hydraulic filter

3. Remove the filter.
4. Lubricate the gasket on the new filter with hydraulic fluid.
5. Ensure that the filter mounting area is clean.
6. Install the filter by hand until the gasket contacts the mounting surface, then rotate it an additional 1/2 turn.
7. Repeat the procedure on the other filter.
8. Start the engine and let it run for about two minutes to purge air from the system.
9. Shut off the engine and check for leaks.

Checking the Hydraulic Lines and Hoses

Daily, check hydraulic lines and hoses for leaks, kinked lines, loose mounting supports, wear, loose fittings,

weather deterioration, and chemical deterioration. Make all necessary repairs before operating.

⚠ WARNING

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

- Make sure that all hydraulic fluid hoses and lines are in good condition and that all hydraulic connections and fittings are tight before applying pressure to the hydraulic system.
- Keep your body and hands away from pin-hole 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.
- Get immediate medical help if fluid is injected into skin.

Using the Hydraulic System Test Ports

Use the hydraulic system test ports to test the pressure in the hydraulic circuits. Contact your local Toro distributor for assistance.

Use the test ports on the front hydraulic tubes ([Figure 73](#)) to assist in troubleshooting the traction circuit.

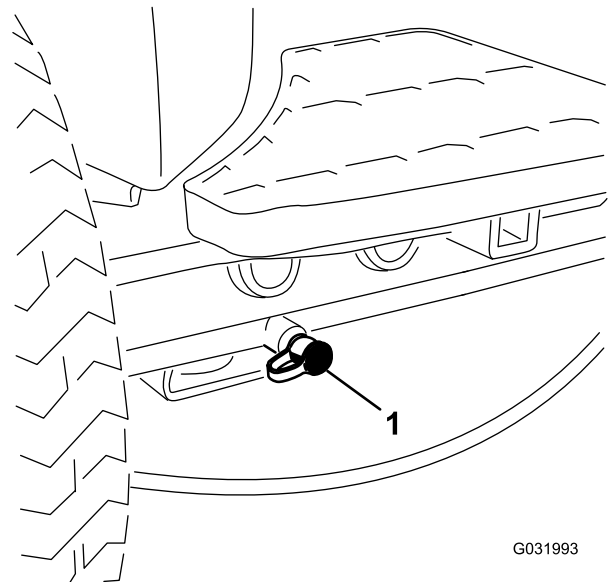


Figure 73

1. Traction-circuit-test port

Use the test ports on the mow manifold block (Figure 74) to assist in troubleshooting the mow circuit.

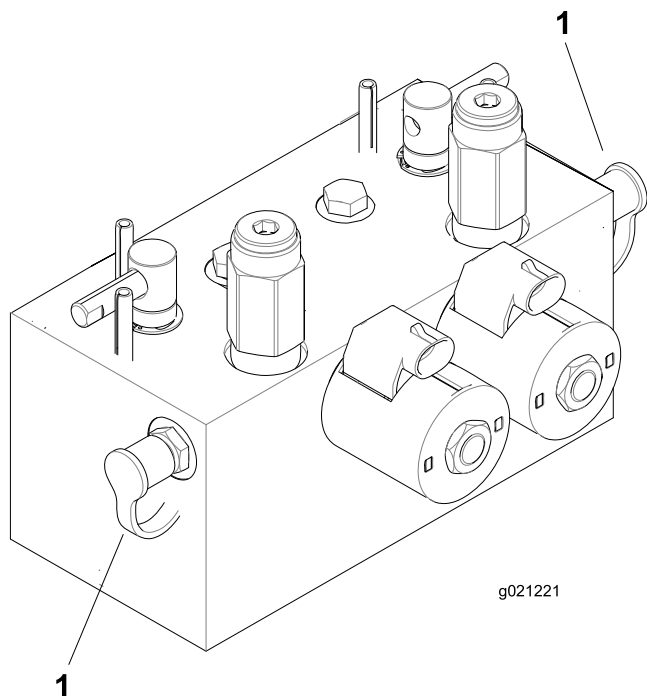


Figure 74

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1. Mow circuit test ports (2)

Use the test port on the lift manifold block (Figure 75) to assist in troubleshooting the lift circuit.

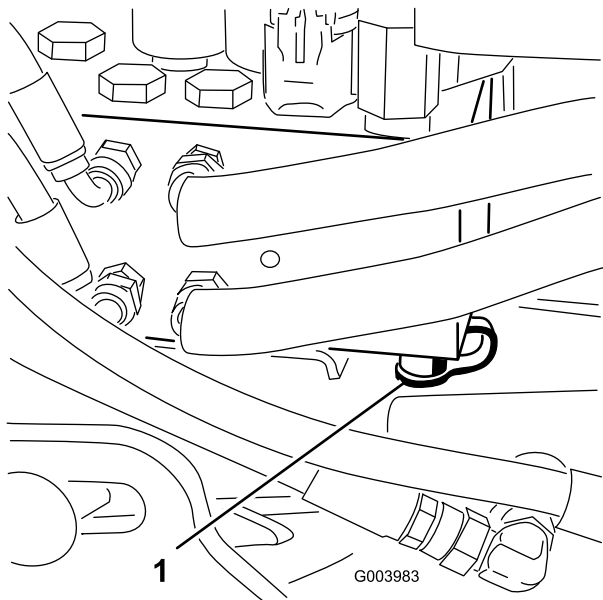


Figure 75

g003983

1. Lift circuit test port

Cutting Unit System Maintenance

Cutting Unit Safety

A worn or damaged cutting unit can break, and a piece of a reel or bedknife could be thrown at you or bystanders, resulting in serious personal injury or death.

- Inspect the cutting units periodically for wear or damage.
- Use care when checking the cutting units. Wrap the blades or wear gloves, and use caution when servicing the reels and bedknives. Only replace or sharpen the reels and bedknives; never straighten or weld them.
- On multi-bladed machines, take care as rotating 1 reel can cause other blades to rotate.

Backlapping the Cutting Units

⚠ WARNING

Contact with the reels or other moving parts can result in personal injury.

- Keep your fingers, hands, and clothing away from the reels or other moving parts.
- Never attempt to turn the reels by hand or foot while the engine is running.

Note: When backlapping, the front units all operate together, and the rear units operate together.

1. Position the machine on a level surface, lower the cutting units, shut off the engine, engage the parking brake, and move the Enable/Disable switch to DISABLE position.
2. Unlock and raise the seat to expose the backlap levers (Figure 76).
3. Make initial reel to bedknife adjustments appropriate for backlapping on all cutting units which are to be backlapped; refer to the cutting unit *Operator's Manual*.
4. Start the engine and run at low idle speed.

⚠ DANGER

Changing the engine speed while backlapping may cause the reels to stall.

- Never change the engine speed while backlapping.
- Only backlap at idle engine speed.

5. Select either front, rear, or both backlap levers to determine which units to backlap (Figure 76).

⚠ DANGER

To avoid personal injury, be certain that you are clear of the cutting units before proceeding.

6. With the Mow/Transport lever in the Mow position, move the Enable/Disable switch to the ENABLE position. Move the Lower Mow/Lift control forward to start the backlapping operation on the designated reels.
7. Apply lapping compound with a long handle brush. Never use a short handled brush.
8. If the reels stall or become erratic while backlapping, select a higher reel speed setting until the speed stabilizes, then return the reel speed to your desired speed.
9. To make an adjustment to the cutting units while backlapping, turn the reels off by moving the Lower Mow/Raise lever rearward; the Enable/Disable switch to the DISABLE position, and shut off the engine. After completing adjustments, repeat steps 4 through 8.

the cutting unit reel speed to the desired mowing setting.

Important: If the backlap switch is not returned to the OFF position after backlapping, the cutting units will not raise or function properly.

Note: For a better cutting edge, run a file across the front face of the bedknife after lapping. This removes any burrs or rough edges that may have built up on the cutting edge.

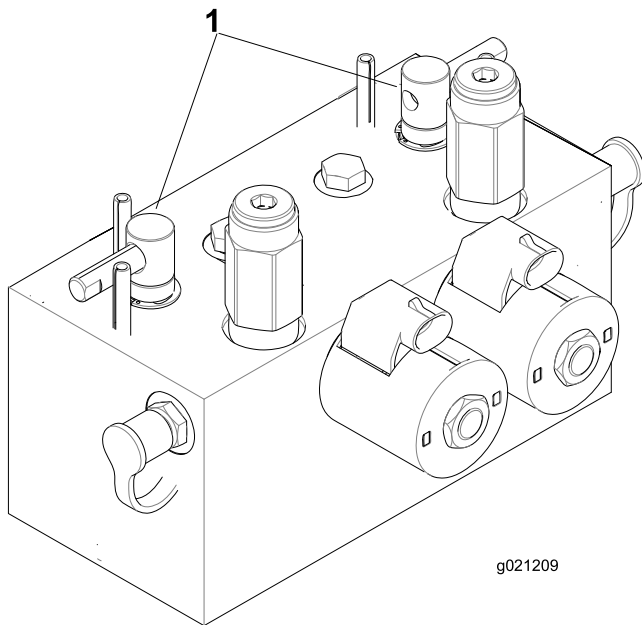


Figure 76

1. Backlap levers

-
10. Repeat the procedure for all cutting units you want to backlap.
 11. When finished, return the backlap levers to the Mow position, lower the seat, and wash all lapping compound off the cutting units. Adjust cutting unit reel to bedknife as needed. Adjust

Storage

Preparing the Traction Unit

1. Thoroughly clean the traction unit, cutting units, and engine.
2. Check the tire pressure. Inflate all traction unit tires to 83 to 103 kPa (12 to 15 psi).
3. Check all fasteners for looseness and tighten them as necessary.
4. Grease 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.

Preparing the Engine

1. Drain the engine oil from the oil pan and replace the drain plug.
2. Remove and discard the oil filter. Install a new oil filter.
3. Refill the oil pan with designated quantity of motor oil.
4. Start the engine and run it at idle speed for approximately two minutes.
5. Shut off the engine.
6. Thoroughly drain all fuel from the fuel tank, lines, and the fuel filter/water separator assembly.
7. Flush the fuel tank with fresh, clean diesel fuel.
8. Secure all fuel system fittings.
9. Thoroughly clean and service the air cleaner assembly.
10. Seal the air cleaner inlet and the exhaust outlet with weatherproof tape.
11. Check the antifreeze protection and add as needed for expected minimum temperature in your area.

Notes:

European Privacy Notice

The Information Toro Collects

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

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

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

The Way Toro Uses Information

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

Retention of your Personal Information

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

Toro's Commitment to Security of Your Personal Information

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

Access and Correction of your Personal Information

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

Australian Consumer Law

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

California Proposition 65 Warning Information

What is this warning?

You may see a product for sale that has a warning label like the following:



WARNING: Cancer and Reproductive Harm—www.p65Warnings.ca.gov.

What is Prop 65?

Prop 65 applies to any company operating in California, selling products in California, or manufacturing products that may be sold in or brought into California. It mandates that the Governor of California maintain and publish a list of chemicals known to cause cancer, birth defects, and/or other reproductive harm. The list, which is updated annually, includes hundreds of chemicals found in many everyday items. The purpose of Prop 65 is to inform the public about exposure to these chemicals.

Prop 65 does not ban the sale of products containing these chemicals but instead requires warnings on any product, product packaging, or literature with the product. Moreover, a Prop 65 warning does not mean that a product is in violation of any product safety standards or requirements. In fact, the California government has clarified that a Prop 65 warning "is not the same as a regulatory decision that a product is 'safe' or 'unsafe.'" Many of these chemicals have been used in everyday products for years without documented harm. For more information, go to <https://oag.ca.gov/prop65/faqs-view-all>.

A Prop 65 warning means that a company has either (1) evaluated the exposure and has concluded that it exceeds the "no significant risk level"; or (2) has chosen to provide a warning based on its understanding about the presence of a listed chemical without attempting to evaluate the exposure.

Does this law apply everywhere?

Prop 65 warnings are required under California law only. These warnings are seen throughout California in a wide range of settings, including but not limited to restaurants, grocery stores, hotels, schools, and hospitals, and on a wide variety of products. Additionally, some online and mail order retailers provide Prop 65 warnings on their websites or in catalogs.

How do the California warnings compare to federal limits?

Prop 65 standards are often more stringent than federal and international standards. There are various substances that require a Prop 65 warning at levels that are far lower than federal action limits. For example, the Prop 65 standard for warnings for lead is 0.5 µg/day, which is well below the federal and international standards.

Why don't all similar products carry the warning?

- Products sold in California require Prop 65 labelling while similar products sold elsewhere do not.
- A company involved in a Prop 65 lawsuit reaching a settlement may be required to use Prop 65 warnings for its products, but other companies making similar products may have no such requirement.
- The enforcement of Prop 65 is inconsistent.
- Companies may elect not to provide warnings because they conclude that they are not required to do so under Prop 65; a lack of warnings for a product does not mean that the product is free of listed chemicals at similar levels.

Why does Toro include this warning?

Toro has chosen to provide consumers with as much information as possible so that they can make informed decisions about the products they buy and use. Toro provides warnings in certain cases based on its knowledge of the presence of one or more listed chemicals without evaluating the level of exposure, as not all the listed chemicals provide exposure limit requirements. While the exposure from Toro products may be negligible or well within the "no significant risk" range, out of an abundance of caution, Toro has elected to provide the Prop 65 warnings. Moreover, if Toro does not provide these warnings, it could be sued by the State of California or by private parties seeking to enforce Prop 65 and subject to substantial penalties.



The Toro Warranty

A Two-Year Limited Warranty

Conditions and Products Covered

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

* Product equipped with an hour meter.

Instructions for Obtaining Warranty Service

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

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

Owner Responsibilities

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

Items and Conditions Not Covered

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

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

Countries Other than the United States or Canada

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

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

Parts

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

Deep Cycle and Lithium-Ion Battery Warranty:

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

Maintenance is at Owner's Expense

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

General Conditions

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

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

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

Note regarding engine warranty:

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