Form No. 3464-119 Rev B

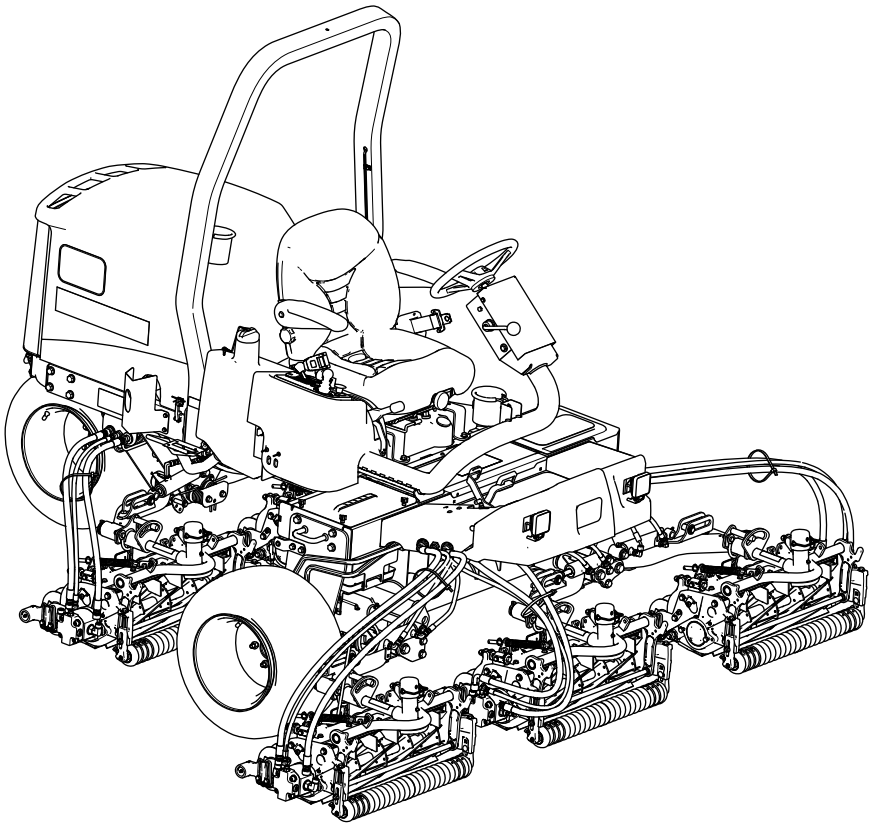
TORO®

Count on it.

Operator's Manual

Reelmaster® 3555, 3575, and 3550 Traction Units

Model No. 03820—Serial No. 410200000 and Up
Model No. 03821—Serial No. 410200000 and Up
Model No. 03910—Serial No. 410200000 and Up



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

CE UK CA

3464-119

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.

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

⚠ 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.

Visit www.Toro.com for more information, including safety tips, training materials, accessory information, help finding a dealer, or to register your product.

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

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

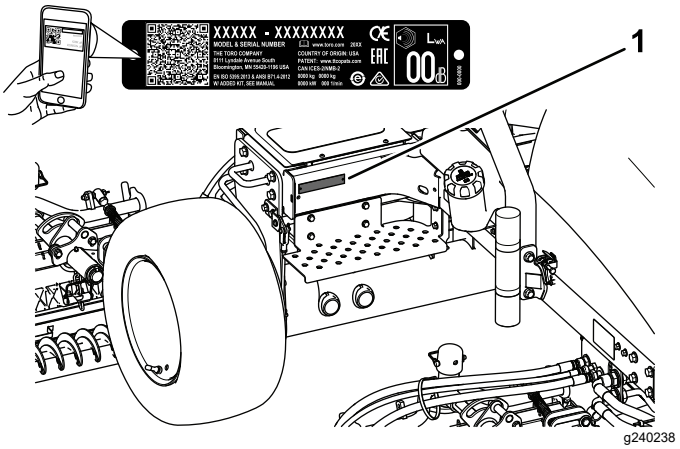


Figure 1

1. Model and serial number location

Model No. _____

Serial No. _____

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

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

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Bloomington, MN 55420

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Safety

General Safety

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

- Read and understand the contents of this *Operator's Manual* before starting the engine.
- Use your full attention while operating the machine. Do not engage in any activity that causes distractions; otherwise, injury or property damage may occur.
- Do not put your hands or feet near moving components of the machine.
- Do not operate the machine without all guards and other safety protective devices in place and functioning properly on the machine.
- Keep bystanders and children out of the operating area. Never allow children to operate the machine.
- Shut off the engine, remove the key, and wait for all movement to stop before you leave the operator's position. Allow the machine to cool before adjusting, servicing, cleaning, or storing it.

Safety-Alert Symbol

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



g000502

Figure 2

Safety-alert symbol

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

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

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

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

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

Safety and Instructional Decals

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

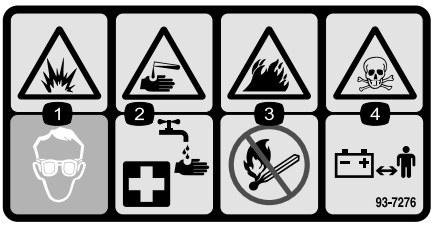


decalbatterysymbols

Battery Symbols

Some or all of these symbols are on your battery.

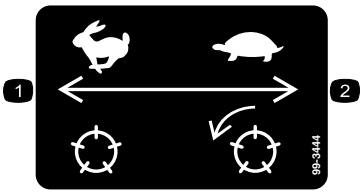
1. Explosion hazard
2. No fire, open flame, or smoking
3. Caustic liquid/chemical burn hazard
4. Wear eye protection.
5. Read the *Operator's Manual*.
6. Keep bystanders away from the battery.
7. Wear eye protection; explosive gases can cause blindness and other injuries.
8. Battery acid can cause blindness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



decal93-7276

93-7276

1. Explosion hazard—wear eye protection.
2. Caustic liquid/chemical burn hazard—to perform first aid, flush with water.
3. Fire hazard—no fire, open flames, or smoking.
4. Poison hazard—keep children away from the battery.



decal99-3444

99-3444

1. Transport speed—fast
2. Mowing speed—slow

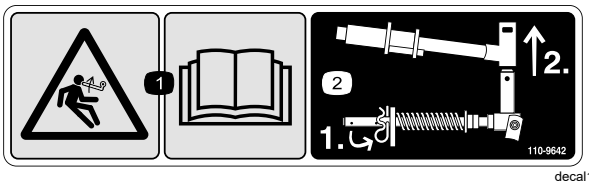
Models 03821 and 03910



decal106-6755

106-6755

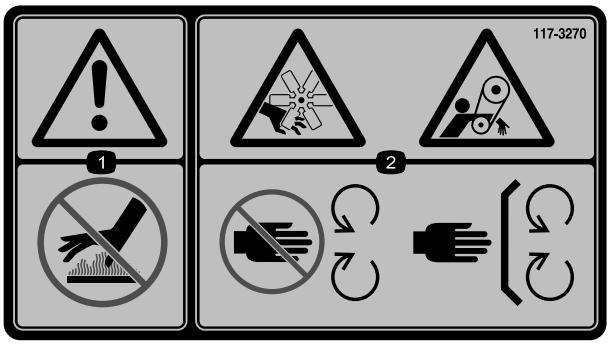
1. Engine coolant under pressure.
2. Explosion hazard—read the *Operator's Manual.*
3. Warning—do not touch the hot surface.
4. Warning—read the *Operator's Manual.*



decal110-9642

110-9642

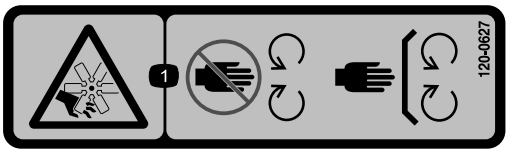
1. Stored energy hazard—read the *Operator's Manual.*
2. Move the cotter pin to the hole closest to the rod bracket and then remove the lift arm and pivot yoke.



decal117-3270

117-3270

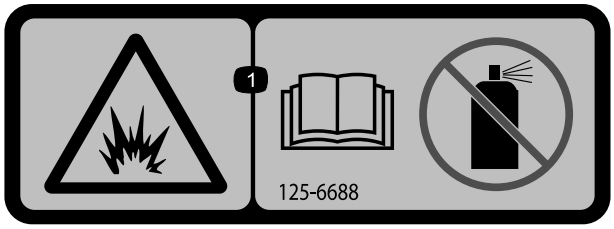
1. Warning—do not touch the hot surface.
2. Cutting/dismemberment hazard, hand; entanglement hazard, belt—stay away from moving parts, keep all guards and shields in place.



decal120-0627

120-0627

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



decal125-6688

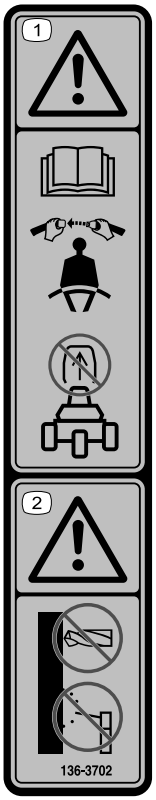
125–6688

1. Explosion hazard—Read the *Operator's Manual*; Do not use starting fluid.



decal133-8062

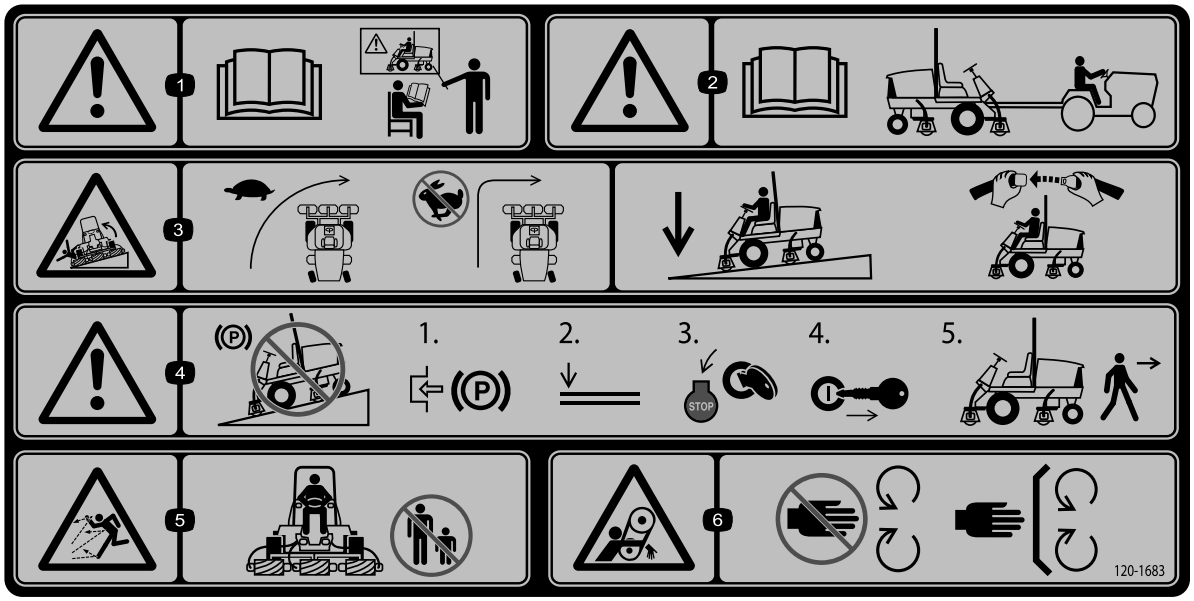
133-8062



decal136-3702

136-3702

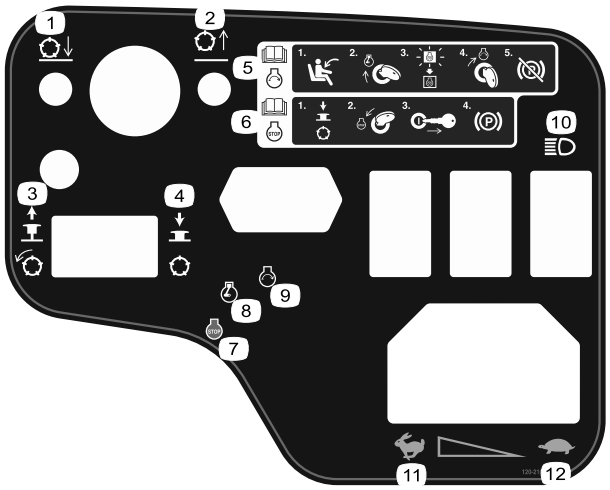
1. Warning—Read the *Operator's Manual*; wear a seatbelt; do not remove the roll bar.
2. Warning—Do not modify the roll bar.



decal120-1683

120-1683

1. Warning—read the *Operator's Manual*; all operators should be trained before operating the machine.
2. Warning—read the *Operator's Manual* before towing the machine.
3. Tipping hazard—drive slowly when turning; do not turn sharply while traveling fast; lower the cutting units when driving down slopes; use a rollover protection system and wear the seatbelt.
4. Warning—do not park the machine on slopes; engage the parking brake, lower the cutting units, shut off the engine, and remove the key before leaving the machine.
5. Thrown object hazard—keep bystanders away.
6. Entanglement hazard, belt—stay away from moving parts; keep all guards and shields in place.

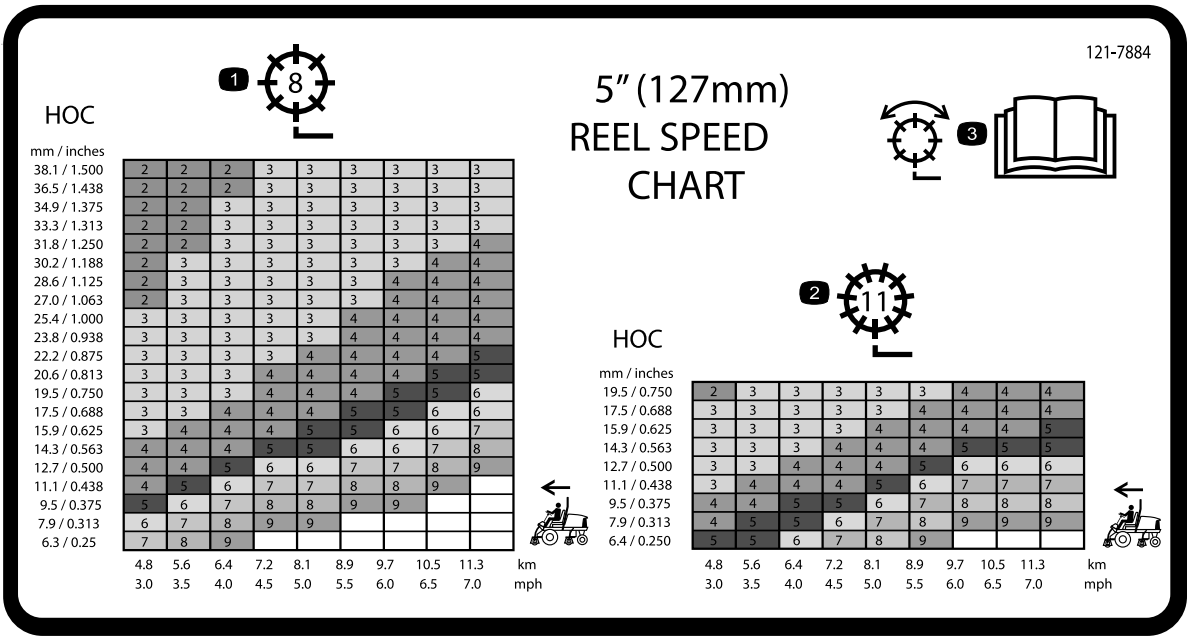


decal120-2105

120-2105

1. Lower the cutting units.
2. Raise the cutting units.
3. Pull up to engage the cutting units.
4. Push down to disengage the cutting units.
5. Read the *Operator's Manual* for information on starting the engine—sit in the operator's position, turn the key to the engine preheat position, wait until the engine preheat light turns off, turn the key to the engine start position, and disengage the parking brake.
6. Read the *Operator's Manual* for information on stopping the engine—disengage the cutting units, turn the key to the engine stop position, remove the key from the ignition, and engage the parking brake.
7. Engine—Shut off
8. Engine—Preheat
9. Engine—Start
10. Lights
11. Fast
12. Slow

Models 03910 and 03820

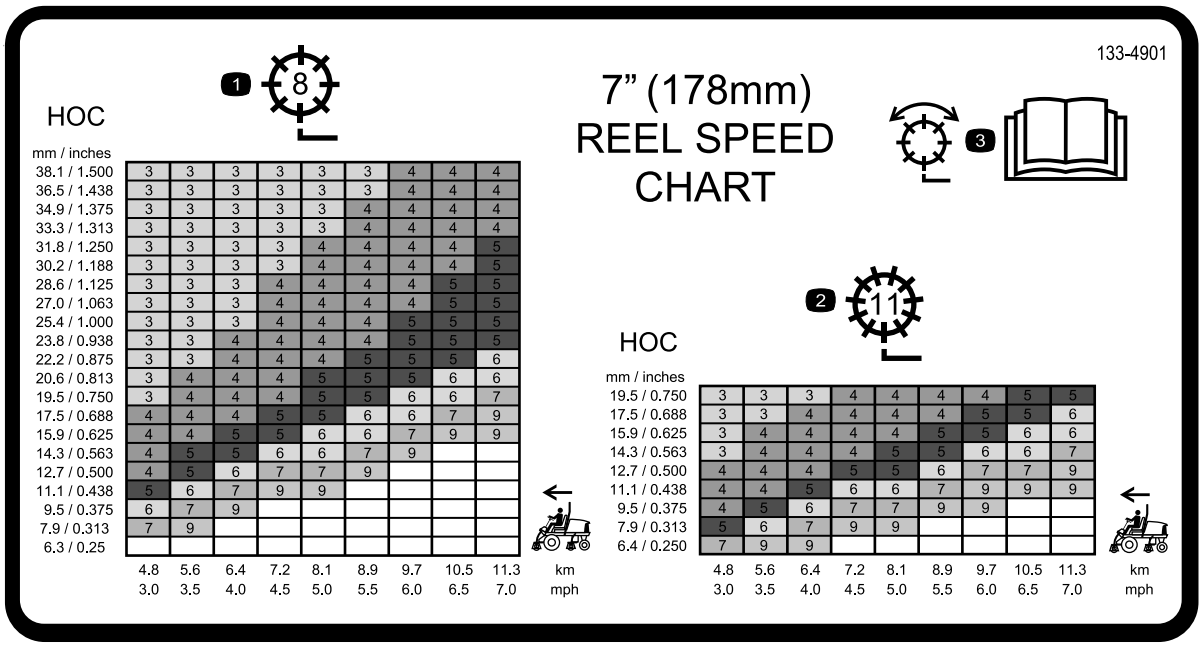


decal121-7884

121-7884

1. 8-blade reel adjustment
2. 11-blade reel adjustment
3. Read the *Operator’s Manual* for information on adjusting the reel.

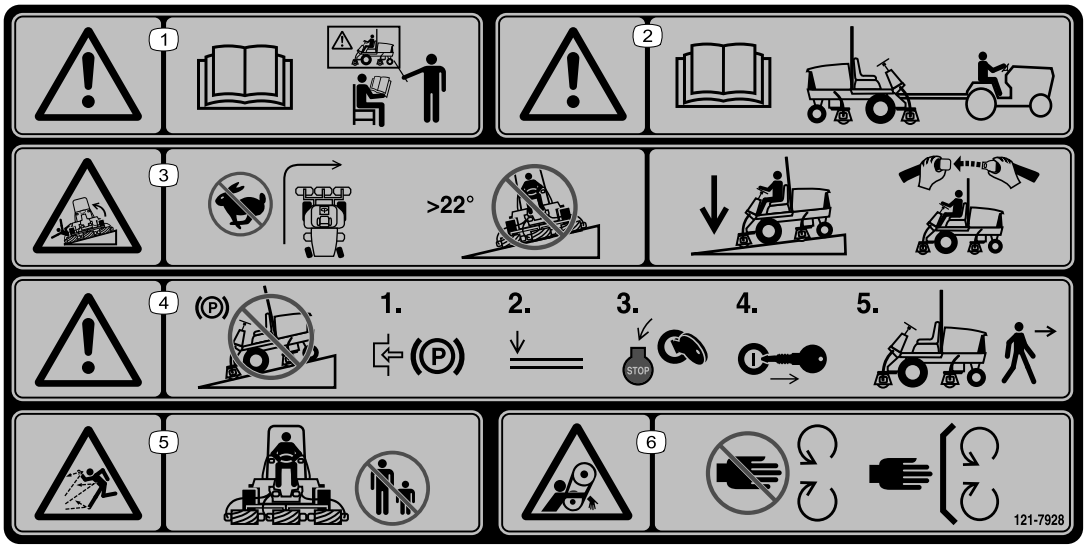
Model 03821



decal133-4901

133-4901

1. 8-blade reel adjustment
2. 11-blade reel adjustment
3. Read the *Operator’s Manual* for information on adjusting the reel.

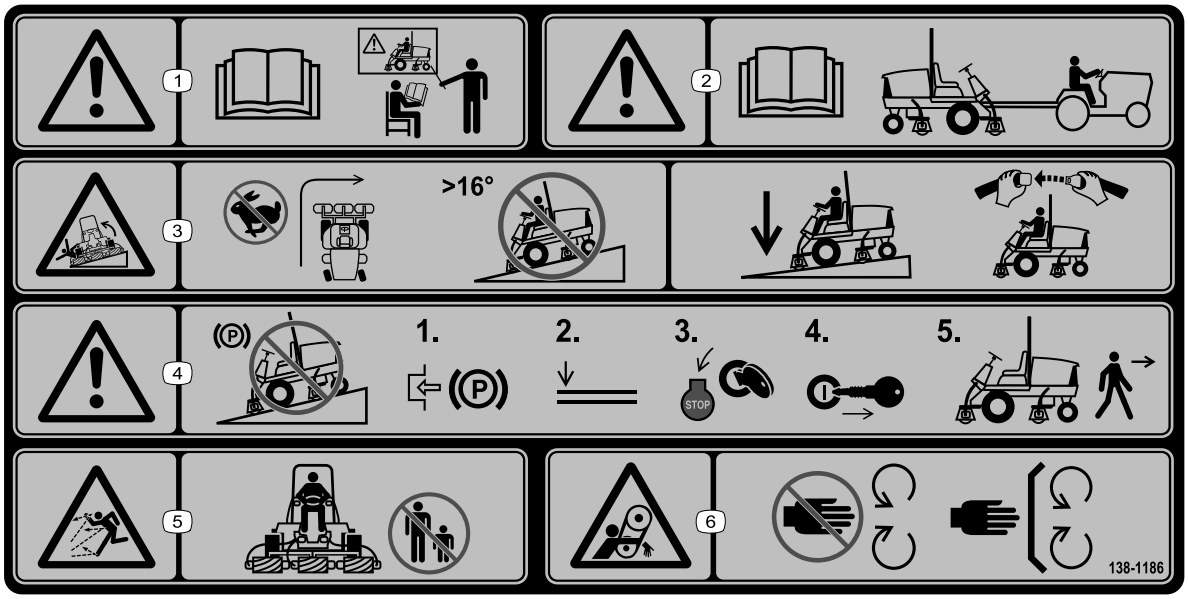


decal121-7928

121-7928

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*; all operators should be trained before operating the machine.
2. Warning—read the *Operator's Manual* before towing the machine.
3. Tipping hazard—do not turn sharply while traveling fast; do not drive up or down slopes greater than 22°; lower the cutting units when driving down slopes; use a rollover protection system and wear the seatbelt.
4. Warning—do not park the machine on slopes; engage the parking brake, lower the cutting units, shut off the engine, and remove the key before leaving the machine.
5. Thrown object hazard—keep bystanders away.
6. Entanglement hazard, belt—stay away from moving parts; keep all guards and shields in place.

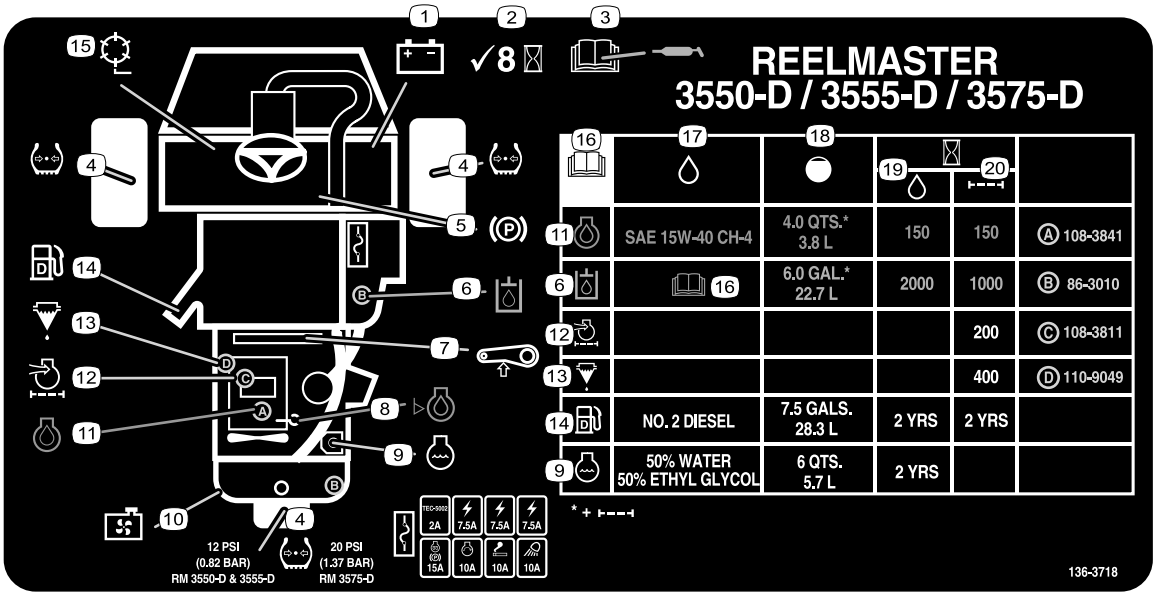


decal138-1186

138-1186

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*; all operators should be trained before operating the machine.
2. Warning—read the *Operator's Manual* before towing the machine.
3. Tipping hazard—do not turn sharply while traveling fast; do not drive up or down slopes greater than 16°; lower the cutting units when driving down slopes; use a rollover protection system and wear the seatbelt.
4. Warning—do not park the machine on slopes; engage the parking brake, lower the cutting units, shut off the engine, and remove the key before leaving the machine.
5. Thrown object hazard—keep bystanders away.
6. Entanglement hazard, belt—stay away from moving parts; keep all guards and shields in place.



decal136-3718

136-3718

1. Battery
2. Check every 8 hours.
3. Read the *Operator's Manual* for lubrication information.
4. Tire pressure
5. Parking brake
6. Hydraulic fluid
7. Belt
8. Engine oil level
9. Engine coolant
10. Radiator screen
11. Engine oil
12. Engine air filter
13. Fuel/Water separator
14. Fuel
15. Reel speed
16. Read the *Operator's Manual*.
17. Fluids
18. Capacity
19. Fluid interval (hours)
20. Filter interval (hours)

Setup

Loose Parts

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

Procedure	Description	Qty.	Use
1	Right hose guide (Models 03820 and 03821) Left hose guide (Models 03820 and 03821)	1 1	Install the cutting units.
2	No parts required	–	Adjust the turf compensation spring.
3	No parts required	–	Adjust the tire air pressure.
4	Cutting-unit kickstand	1	Use the cutting-unit kickstand.
5	Lock bracket Rivet Washer Screw (1/4 x 2 inches) Locknut (1/4 inch)	1 2 1 1 1	Install the hood latch (CE machines).
6	Year of production decal CE decal (Part No. 133-8095) Danger decal (Part No. 138-1186—Models 03820 and 03821) Danger decal (Part No. 121-7928—Model 03910)	1 1 1 1	Install the CE decals, if required.

Media and Additional Parts

Description	Qty.	Use
Keys	2	Start the engine.
Operator's Manual Engine owner’s manual	1 1	Read the manuals before operating the machine.
Cutting performance paper	1	Use the paper for adjusting the cutting unit reel-to-bedknife contact.
Shim	1	Use the shim for adjusting the cutting unit reel-to-bedknife contact.

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

1

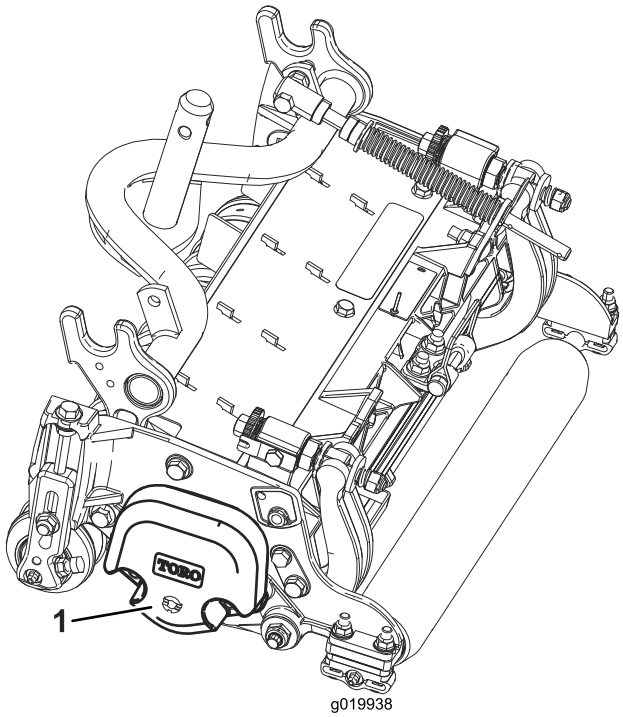
Installing the Cutting Units

Parts needed for this procedure:

1	Right hose guide (Models 03820 and 03821)
1	Left hose guide (Models 03820 and 03821)

Preparing the Machine and Cutting Units

1. Park the machine on a level surface, engage the parking brake, shut off the engine, and remove the key from the ignition switch.
2. Remove the reel motors from the shipping brackets.
3. Remove and discard the shipping brackets.
4. Remove the cutting units from the cartons. Assemble and adjust them as described in the cutting unit *Operator's Manual*.
5. Make sure that the counterweight (Figure 3) is installed to the proper end of the cutting unit as described in the cutting unit *Operator's Manual*.



g019938

Figure 3

1. Counterweight

Positioning the Turf Compensating Spring

All the cutting units are shipped with the turf compensation spring mounted at the right side of the cutting unit. Ensure that the turf compensation spring is mounted to the same side of the cutting unit as the reel drive motor.

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. Otherwise, install the hairpin cotter in the hole in the end of the rod.

1. Remove the 2 carriage bolts and nuts securing the rod bracket to the cutting unit tabs (Figure 4).

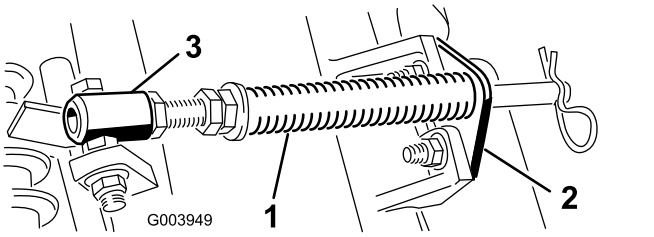


Figure 4

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

2. Remove the flange nut securing the spring tube bolt to the carrier frame tab (Figure 4), and remove the assembly.
3. Mount the spring tube bolt to the opposite tab on the carrier frame and secure it with the flange nut.

   Note: Position the bolt head to the outer side of the tab as shown in Figure 4.

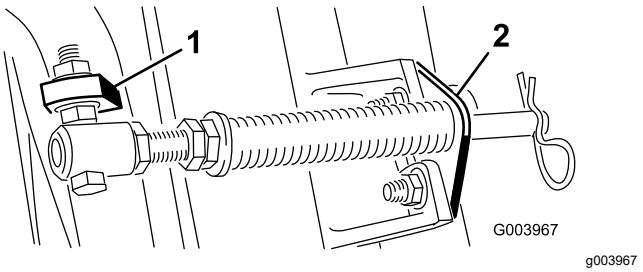


Figure 5

1. Opposite carrier frame tab
2. Rod bracket

4. Mount the rod bracket to the cutting unit tabs with the carriage bolts and nuts (Figure 5).

Installing the Hose Guide

Models 03820 and 03821

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. The hose guides should lean toward the center cutting unit (Figure 6, Figure 7, and Figure 8).

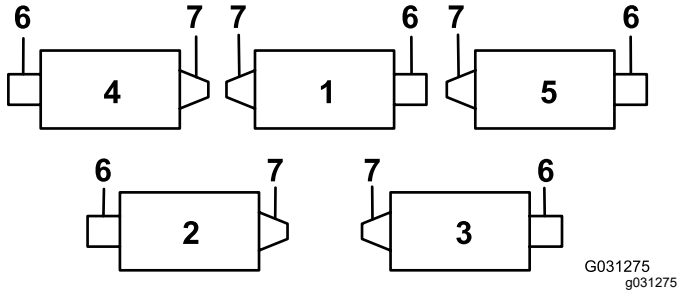


Figure 6

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

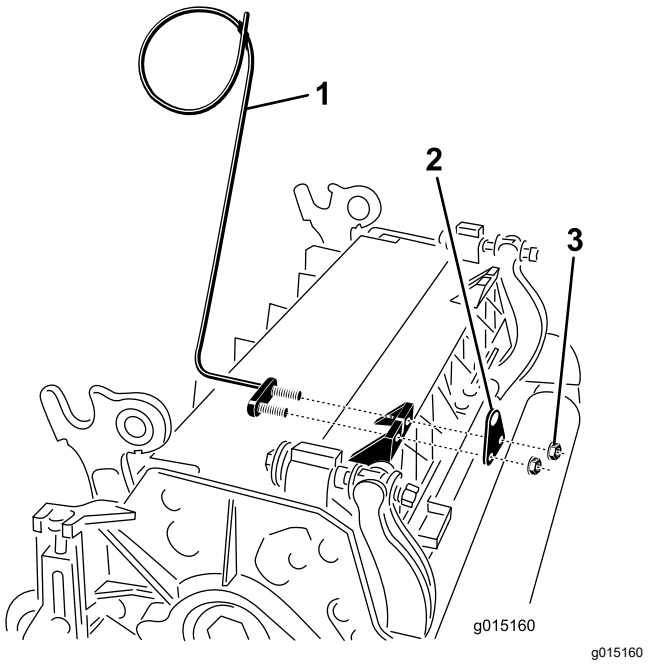


Figure 7

1. Hose guide (left side shown)
2. Rod bracket
3. Nuts

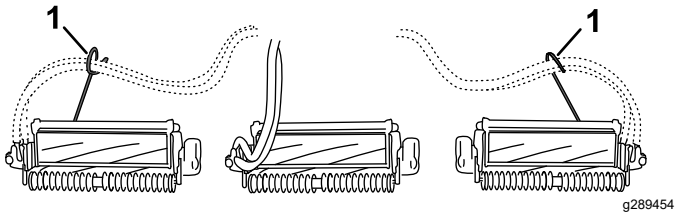


Figure 8

1. Hose guides (each must lean toward the center cutting unit)

Aligning the Cutting Units to the Lift Arms

All Front Cutting Units, and Any Rear Cutting Units with a 1.2 cm (3/4 inch) or Lower Height of Cut

1. Lower all the lift arms completely.
2. Remove the snapper pin and the cap from the lift-arm pivot yoke (Figure 9).

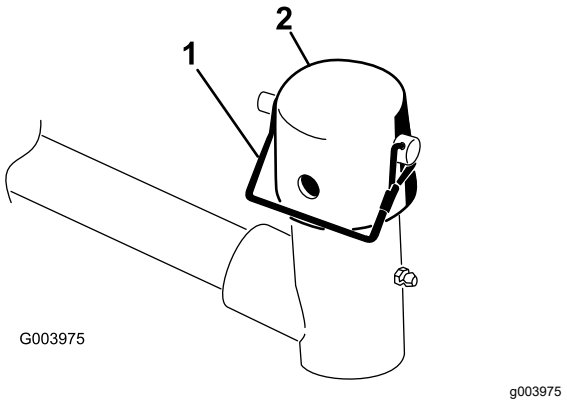


Figure 9

1. Snapper pin
2. Cap

3. 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 10).

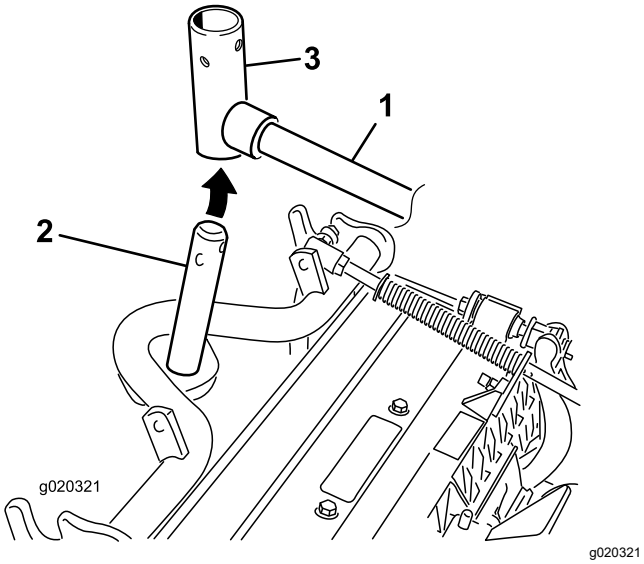


Figure 10

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

Aligning the Rear Cutting Units to the Lift Arms

Cutting Units adjusted for a 1.2 cm (3/4 inch) or Higher Height of Cut

1. 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 11).

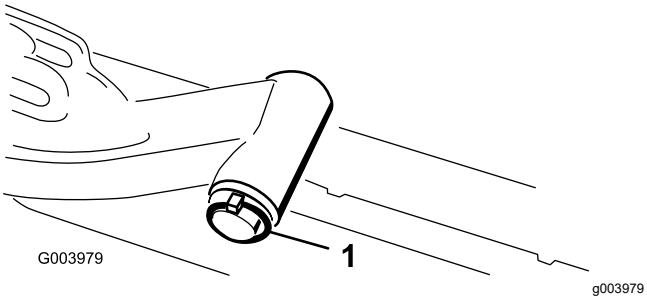


Figure 11

1. Lift-arm shaft lynch pin and washer

2. Insert the lift-arm yoke onto the carrier frame shaft (Figure 10).
3. Insert the lift-arm shaft into the lift arm and secure it with the washer and lynch pin (Figure 11).

Assembling the Cutting Units to the Lift Arms

1. Insert the cap over the carrier frame shaft and lift-arm yoke.
2. Secure the cap and the carrier frame shaft to the lift-arm yoke with the snapper pin.

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 (Figure 9).

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

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

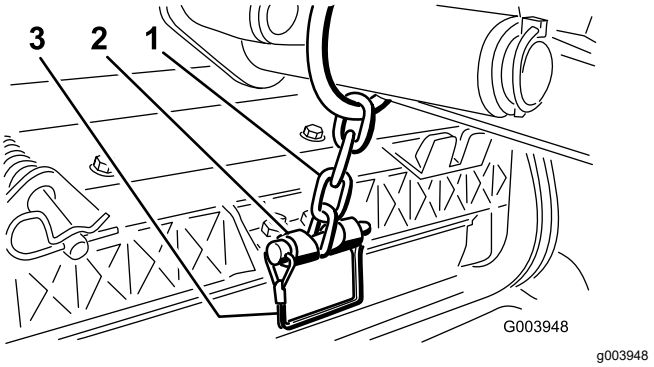


Figure 12

1. Lift-arm chain
2. Chain bracket
3. Snapper pin

Installing the Reel Motors

1. Coat the spline shaft of the reel motor with clean grease.
2. Lubricate the reel-motor O-ring with oil, and install it onto the motor flange.
3. Install the motor by rotating it clockwise so that the motor flanges clear the locknuts (Figure 13).

Important: **Ensure that the reel motor hoses are not twisted, kinked, or at risk of being pinched.**

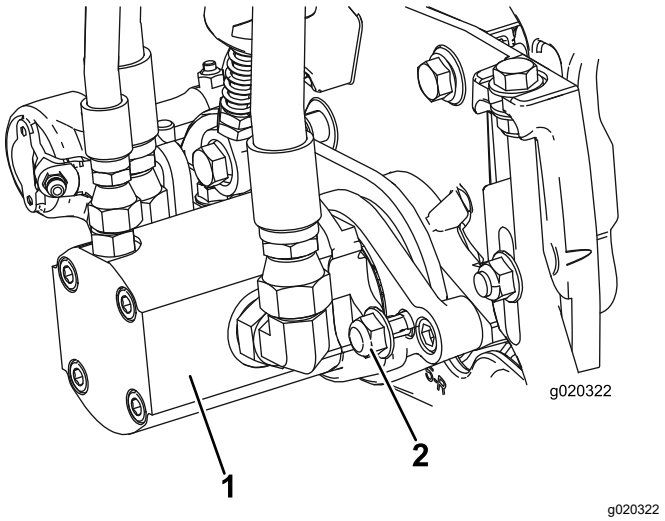


Figure 13

1. Reel-drive motor
2. Mounting nuts

4. Rotate the motor counterclockwise until the flanges encircle the nuts.
5. Torque the nuts to 37 to 45 N·m (27 to 33 ft-lb).

2

Adjusting the Turf Compensation Spring

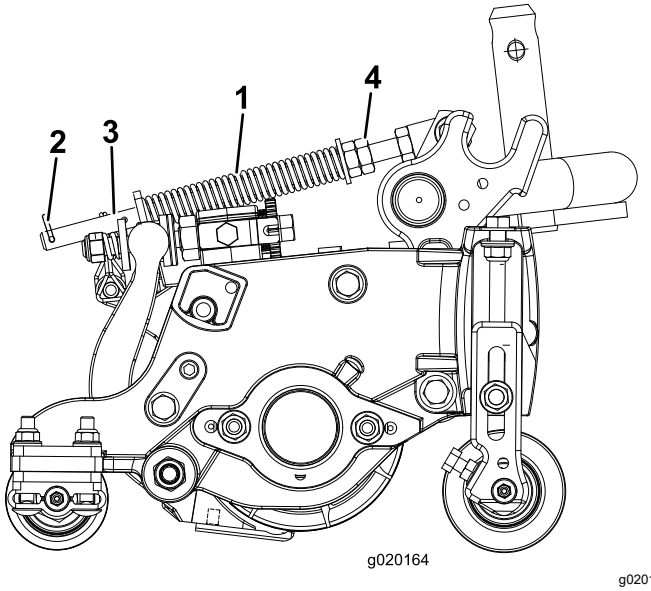
No Parts Required

Procedure

The turf compensation spring (Figure 14) 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.**

1. Align the machine straight ahead, and engage the parking brake.
2. Press the cutting unit drive switch to the DISENGAGE position.
3. Move the mow/transport slide to the MOW position.
4. Start the engine, and push the lower mow/raise lever forward to lower the cutting units to the shop floor.
5. Shut off the engine, remove the key, and wait for all moving parts to stop.
6. Make sure that the hairpin cotter is installed in the rear hole in the spring rod (Figure 14).



g020164

Figure 14

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

7. Tighten the hex nuts on the front end of the spring rod until the compressed length of the spring (Figure 14) is 12.7 cm (5 inches) for 5-inch cutting units and 15.8 cm (6-1/4 inches) for 7-inch cutting units.

   Note: When operating on rough terrain, decrease the spring length by 2.5 cm (1/2 inch). When you decrease spring length, the cutting unit follows the ground less closely.

3

Adjusting Tire Air Pressure

No Parts Required

Procedure

Adjust the tire air pressure at each of the tires; refer to Checking the Tire Pressure (page 51).

Note: The tires are over-inflated for shipping.

4

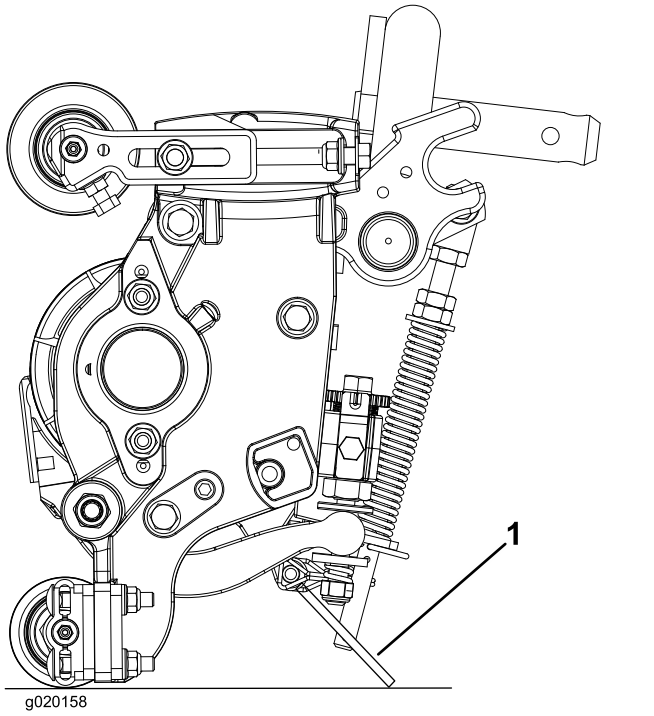
Using the Cutting-Unit Kickstand

Parts needed for this procedure:

1	Cutting-unit kickstand

Procedure

Whenever you tip a 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 15).

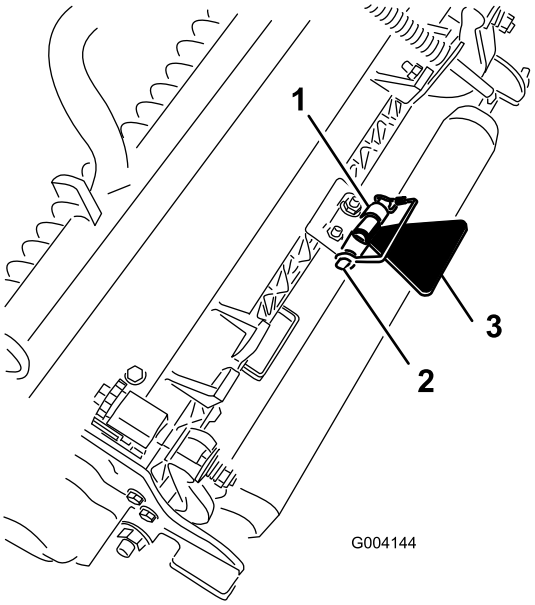


g020158

Figure 15

1. Cutting-unit kickstand

Secure the kickstand to the chain bracket with the snapper pin (Figure 16).



g004144

Figure 16

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

5

Installing the Hood Latch

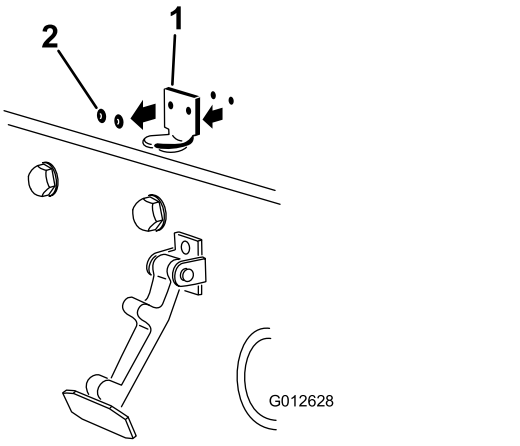
CE Machines

Parts needed for this procedure:

1	Lock bracket
2	Rivet
1	Washer
1	Screw (1/4 x 2 inches)
1	Locknut (1/4 inch)

Procedure

1. Unhook the hood latch from the hood-latch bracket.
2. Remove the rivets (2) securing the hood-latch bracket to the hood (Figure 17). Remove the hood-latch bracket from the hood.

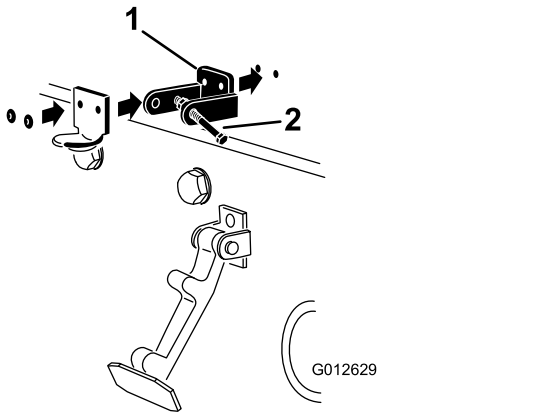


g012628

Figure 17

1. Hood-latch bracket
2. Rivets

3. While aligning the mounting holes, position the CE lock bracket and the hood-latch bracket onto the hood. The lock bracket must be against the hood (Figure 18). Do not remove the bolt and nut assembly from the lock bracket arm.

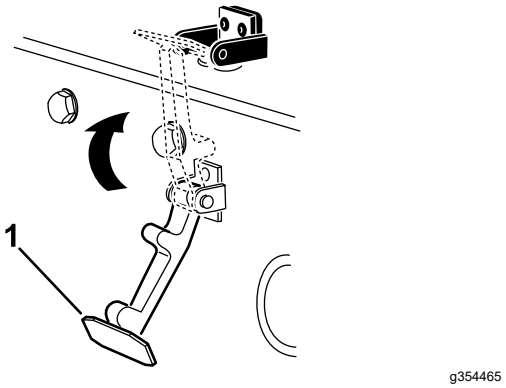


g012629

Figure 18

1. CE lock bracket
2. Bolt and nut assembly

4. Align the washers with the holes on the inside of the hood.
5. Rivet the brackets and the washers to the hood (Figure 18).
6. Hook the latch onto the hood-latch bracket (Figure 19).



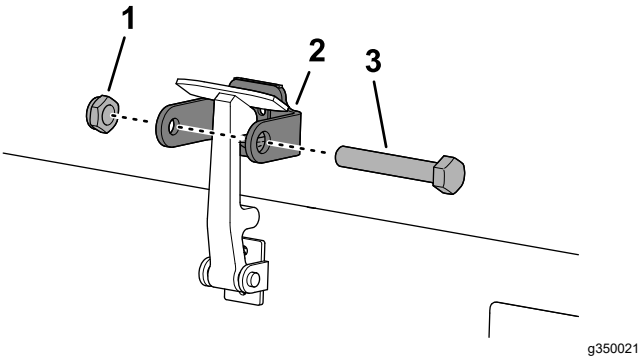
g354465

Figure 19

1. Hood latch

7. Screw the bolt into the other arm of hood-lock bracket to lock the latch in position (Figure 20).

   Note: Tighten the nut and bolt until the bolt no longer moves forward and backward in the CE lock bracket.



g350021

Figure 20

1. Nut
2. Arm of hood-lock bracket
3. Bolt

6

Installing the CE Decals

Parts needed for this procedure:

1	Year of production decal
1	CE decal (Part No. 133-8095)
1	Danger decal (Part No. 138-1186—Models 03820 and 03821)
1	Danger decal (Part No. 121-7928—Model 03910)

Applying the Year of Production Decal and CE Decal

1. Wipe clean the left frame near the model/serial plate with alcohol, and allow the frame to dry (Figure 21).

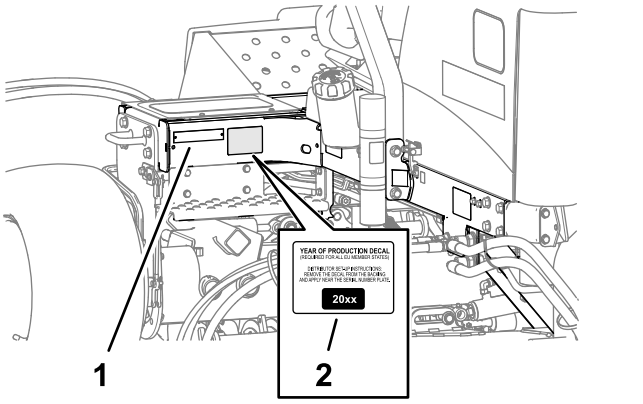


Figure 21

1. Model/serial plate
2. Year of production decal

2. Remove the backing and apply the Year of Production decal to the frame near the serial plate as shown in Figure 21.
3. Wipe clean the left frame near the hood lock with alcohol, and allow the frame to dry (Figure 22).

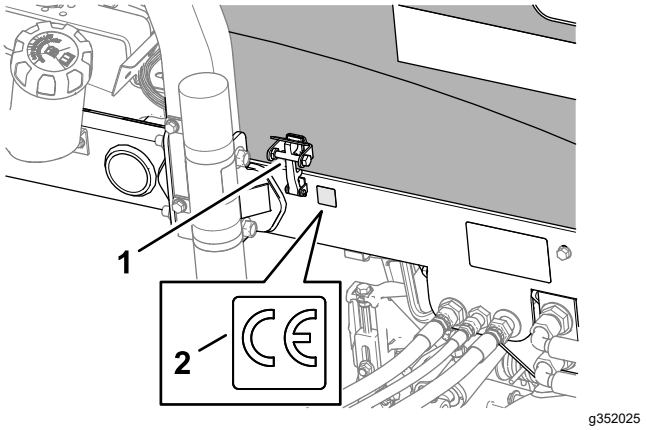


Figure 22

1. CE hood latch
2. CE decal (Part No. 133-8095)

4. Remove the backing and apply the CE decal Part No. 133-8095 to the frame as shown in Figure 22.

Applying Danger Decal

Machine Model 03910

1. Wipe clean the standard warning decal with alcohol, and allow the frame to dry (Figure 23).

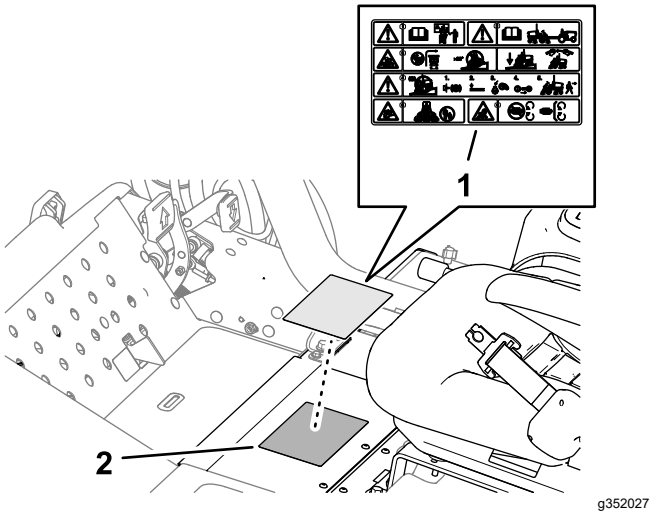


Figure 23

1. CE warning decal (Part No. 121-7928)
2. Standard warning decal

2. Remove the backing and apply the CE warning decal (Part No. 121-7928) over the standard warning decal as shown in Figure 23.

Applying Danger Decal

Machine Models 03820 and 03821

1. Wipe clean the standard warning decal with alcohol, and allow the frame to dry (Figure 24).

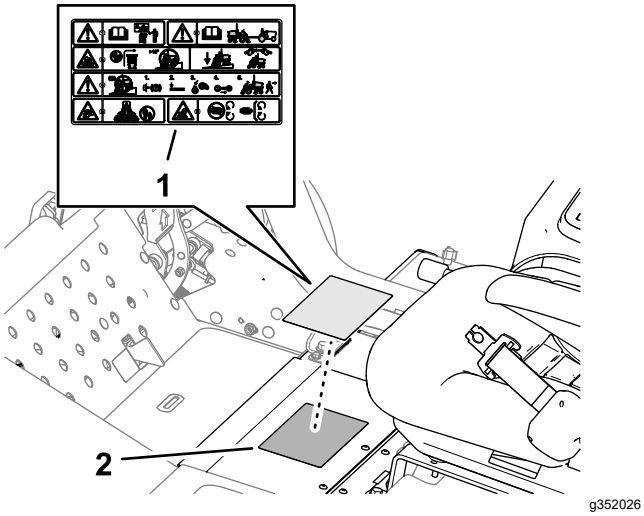


Figure 24

1. CE warning decal (Part No. 138-1186)
2. Standard warning decal

2. Remove the backing and apply the CE warning decal (Part No. 138-1186) over the standard warning decal as shown in Figure 24.

Product Overview

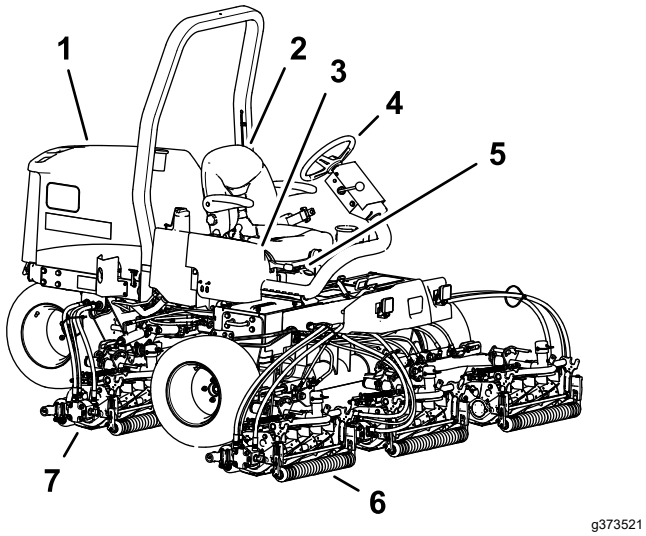


Figure 25

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

Controls

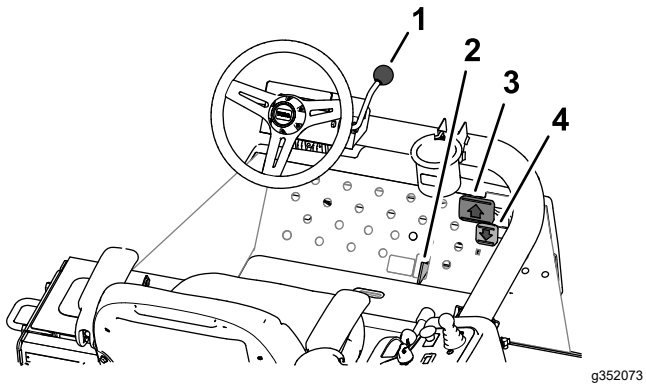


Figure 26

1. Tilt steering lever
2. Mow/transport slide
3. Forward traction pedal
4. Reverse traction pedal

Traction Pedals

Press the forward traction pedal (Figure 26) to move forward. Press reverse traction pedal (Figure 26) to move backward or to assist in stopping when moving forward. Also, allow the pedal to move or move it to the NEUTRAL position to stop the machine.

Mow/Transport Slide

Using your heel, move the mow/transport slide (Figure 26) left to the TRANSPORT position or right to the MOW position.

- The cutting units only operate when the mow/transport slide is in the MOW position.
- The cutting units do not lower when the mow/transport slide is in the TRANSPORT position.

Tilt-Steering Lever

Pull the tilt-steering lever (Figure 26) back to tilt the steering wheel to the desired position. Then push the lever forward to secure the position.

Control Console

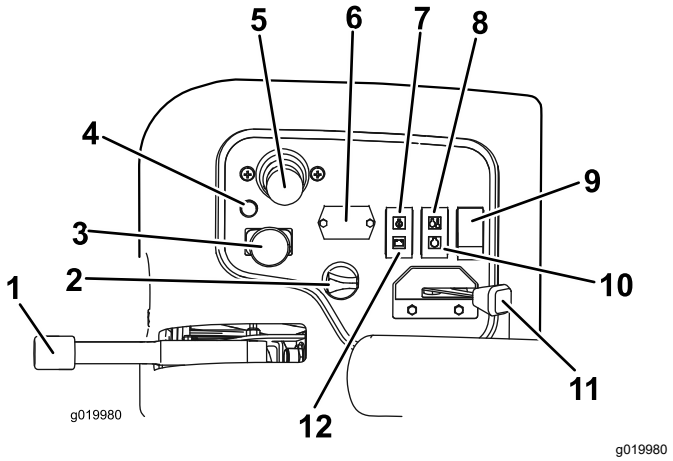


Figure 27

1. Parking brake
2. Ignition switch
3. Cutting unit drive switch
4. Diagnostic light
5. Lower mow/raise control lever
6. Hour meter
7. Oil-pressure light
8. Temperature light
9. Light switch
10. Glow-plug indicator light
11. Throttle
12. Alternator light

Ignition Switch

Use the ignition switch (Figure 27) to run the engine and lights. The ignition switch has 3 positions:

- The SHUT OFF position shuts off the engine.
- The RUN/PREHEAT position allows the engine to run or preheats the cylinder head of the engine.
- The START position energizes the starter.

Note: When the key is in the RUN/PREHEAT position, the glow plug energizes and the indicator light illuminates for approximately 7 seconds.

Throttle

Move the throttle (Figure 27) forward to increase the engine speed and rearward to decrease the engine speed.

Cutting Unit Drive Switch

The cutting unit drive switch (Figure 27) has 2 positions: ENGAGE and DISENGAGE. The rocker switch operates a solenoid valve on the valve bank to drive the cutting units.

Hour Meter

The hour meter (Figure 27) indicates the total hours of machine operation. It starts to function whenever the key switch is on.

Lower Mow/Raise Lever

Use the lower mow/raise lever (Figure 27) to lower the cutting units and run reels or raises the cutting units and stop the reels.

You cannot lower the cutting units when the mow/transport lever is in the TRANSPORT position.

Note: When the cutting unit drive switch is in the ENGAGE position, you do not need to hold the lever in the forward position while the cutting units are lowered or raised.

Engine Coolant Temperature Warning Light

The temperature warning light (Figure 27) illuminates if the engine coolant temperature is high. At this temperature, the cutting units shut off. If the coolant temperature rises another 5.5°C (10°F), the engine shuts off to prevent further damage.

Oil-Pressure Warning Light

The oil-pressure warning light (Figure 27) glows if the engine oil pressure drops below a safe level.

Alternator Light

The alternator light (Figure 27) shuts off when the engine runs. If the alternator light illuminates while the engine runs, check the charging system and repair it as necessary.

Glow-Plug Indicator

The glow-plug indicator light (Figure 27) illuminates when the glow plugs are energized.

Parking Brake

Whenever the engine is shut off, engage the parking brake (Figure 27) to prevent accidental movement of the machine. To engage the parking brake, pull up on the lever; to disengage the brake, push down the lever.

Note: The engine shuts off if you press the traction pedal with the parking brake engaged.

Diagnostic Light

The diagnostic light (Figure 27) illuminates if the system recognizes a system fault.

Power Point

The power point is located at the outboard side of the control console. Use the power point to power 12 V electronic devices (Figure 28).

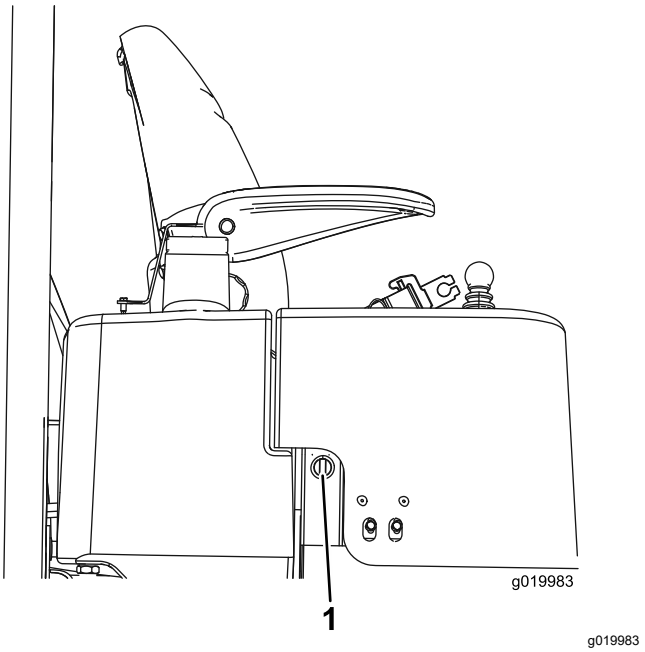
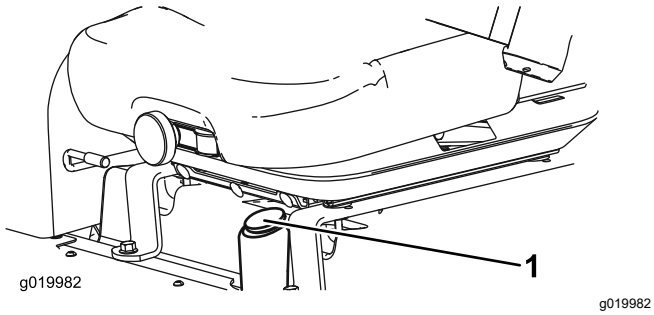


Figure 28

1. Power point

Fuel Gauge

The fuel gauge (Figure 29) indicates the amount of fuel in the tank.



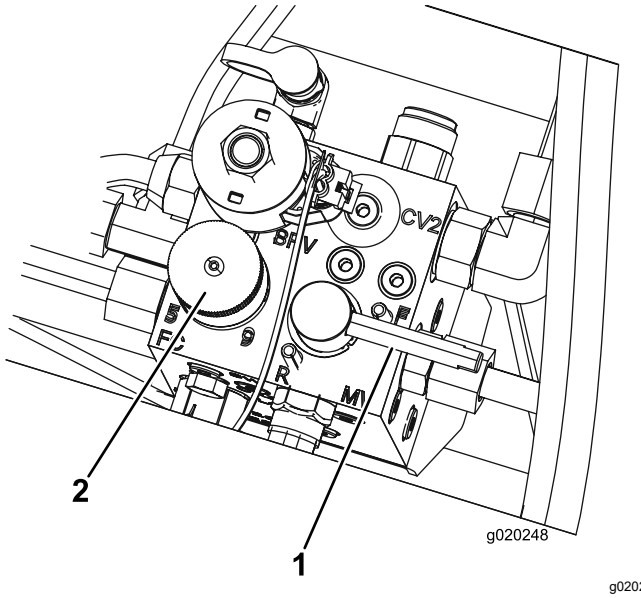
g019982

Figure 29

1. Fuel gauge

Mower Manifold

The mower manifold is located under the platform cover.



g020248

Figure 30

1. Backlap lever
2. Reel speed control knob

Reel Speed Knob

Use the reel speed knob of the mower manifold to adjust the clip rate (reel speed) of the cutting units (Figure 30).

- Turn the reel speed knob counterclockwise to increase the reel speed.
- Turn the knob clockwise to slow the reel speed.

Refer to Clip Rate (Reel Speed) (page 33) and Setting the Reel Speed (page 34) for information on how to adjust the reel speed control.

Backlap Lever

The backlap lever to control the direction the cutting units rotate when you are mowing or when you backlap the reels and bedknives (Figure 30).

- Rotate the backlap lever to the F position when mowing.
- Rotate the lever to the R position when backlapping the cutting units.

Important: **Do not change the backlap lever position while the reels are rotating.**

Specifications

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

Dimensions	Reelmaster 3550	Reelmaster 3555	Reelmaster 3575
Width of Cut	208 cm (82 inches)	254 cm (100 inches)	254 cm (100 inches)
Overall Width	239 cm (94 inches)	284 cm (112 inches)	284 cm (112 inches)
Transport Width	231 cm (91 inches)	231 cm (91 inches)	231 cm (91 inches)
Overall Length	295 cm (110 inches)	267 cm (105 inches)	267 cm (105 inches)
Height to top of ROPS	188 cm (74 inches)	201 cm (79 inches)	206 cm (81 inches)
Wheelbase	151 cm (59.5 inches)	152 cm (60 inches)	152 cm (60 inches)
Weight (configured)	900 kg (1,985 lb)	1034 kg (2,280 lb)	1157 kg (2,550 lb)
Weight (no cutting units)	708 kg (1,560 lb)	751 kg (1,655 lb)	796 kg (1,755 lb)

Attachments/Accessories

A selection of Toro approved attachments and accessories is available for use with the machine to enhance and expand its capabilities. Contact your Authorized Service Dealer or 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

Before Operation

Before Operation Safety

General Safety

- Never allow children or untrained people to operate or service the machine. Local regulations may restrict the age of the operator. The owner is responsible for training all operators and mechanics.
- Become familiar with the safe operation of the equipment, operator controls, and safety signs.
- Before you leave the operator's position, do the following:
  - Park the machine on a level surface.
  - Disengage and lower the cutting units.
  - Engage the parking brake.
  - Shut off the engine and remove the key.
  - Wait for all movement to stop.
  - Allow the machine to cool before adjusting, servicing, cleaning, or storing it.
- Know how to stop the machine and shut off the engine quickly.
- Do not operate the machine without all guards and other safety protective devices in place and functioning properly on the machine.
- Before mowing, always inspect the machine to ensure that the cutting units are in good working condition.
- Inspect the area where you will use the machine and remove all objects that the machine could throw.
- This product generates an electromagnetic field. If you wear an implantable electronic medical device, consult your health care professional before using this product.

Fuel Safety

- Use extreme care in handling fuel. It is flammable and its vapors are explosive.
- Extinguish all cigarettes, cigars, pipes, and other sources of ignition.
- Use only an approved fuel container.
- Do not remove the fuel cap or fill the fuel tank while the engine is running or hot.
- Do not add or drain fuel in an enclosed space.

- Do not store the machine or fuel container where there is an open flame, spark, or pilot light, such as on a water heater or other appliance.
- If you spill fuel, do not attempt to start the engine; avoid creating any source of ignition until the fuel vapors have dissipated.

Fuel Specification

Use only clean, fresh diesel fuel with ultra low (<15 ppm) or low (<1000 ppm) sulfur content. Purchase fuel in quantities that can be used within 180 days to ensure fuel freshness.

Important: **If you use high-sulfur diesel fuel (sulfur content 0.50 % (5000 ppm) to 1.0 % (10000 ppm), change the engine oil and oil filter every 75 hours.**

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 a lower flash point and cold flow characteristics, which eases starting and reduces plugging of the fuel filter.

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

Biodiesel

This machine can also use a biodiesel blended fuel of up to B20 (20% biodiesel, 80% 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.
- Biodiesel blends may damage painted surfaces.
- Use B5 (biodiesel content of 5%) or lesser blends in cold weather.
- Monitor seals, hoses, gaskets in contact with fuel as they may degrade over time.
- The fuel filter may plug up for a period after converting to biodiesel blends.
- Contact a distributor for more information on biodiesel blended fuel.

Filling the Fuel Tank

Fuel tank capacity: approximately 28 L (7.5 US gallons).

1. Park the machine on a level surface, lower the cutting units, engage the parking brake, shut off the engine, and remove the key from the ignition switch.
2. Clean the area around the fuel-tank cap (Figure 31).

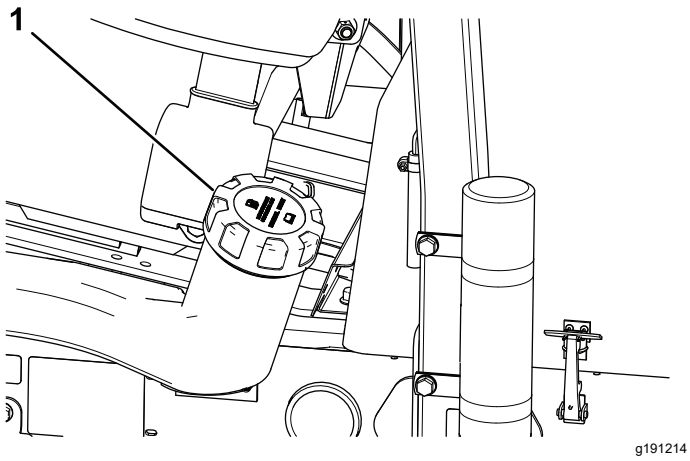


Figure 31

1. Fuel-tank cap

3. Remove the fuel-tank cap.
4. Fill the tank to the bottom of the filler neck.

   Note: Do not overfill the fuel tank.
5. Install the cap.
6. Wipe up any spilled fuel.

Performing Daily Maintenance

Service Interval: Before each use or daily

Before starting the machine each day, perform the Each Use/Daily procedures listed in Maintenance (page 39).

Checking the Interlock Switches

Service Interval: Before each use or daily

⚠ CAUTION

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

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

Important: **If your machine fails any of the interlock switch checks, contact your authorized Toro distributor.**

Preparing the Machine

1. Drive the machine slowly to an open area.
2. Lower the cutting units, shut off the engine, and engage the parking brake.

Checking the Traction Pedal Start-Interlock

1. Sit in the operator's seat.
2. Engage the parking brake.
3. Press the cutting unit drive switch to the DISENGAGE position.
4. Press the traction pedal.
5. Rotate the key to the START position.

   Note: The starter should not crank the engine with the traction pedal pressed.

Checking the Cutting Unit Drive Switch Start-Interlock

1. Sit in the operator's seat.
2. Engage the parking brake.
3. Press the cutting unit drive switch to the ENGAGE position.
4. Keep you foot off the traction pedal.
5. Rotate the key to the START position.

   Note: The starter should not crank the engine with the cutting unit drive switch to the ENGAGE position.

Checking the Lower Mow/Raise Lever and Starter Start-Interlock

1. Sit in the operator's seat.
2. Engage the parking brake.
3. Press the cutting unit drive switch to the DISENGAGE position.
4. Keep you foot off the traction pedal.
5. Hold the lower mow/raise lever forward while rotating the key to the START position.

   Note: The starter should not crank the engine while holding the mow/raise lever forward.

Checking the Parking Brake and Seat Run-Interlock

1. Sit in the operator's seat.
2. Engage the parking brake.
3. Press the cutting unit drive switch to the DISENGAGE position.
4. Keep you foot off the traction pedal.
5. Start the engine.
6. Disengage the parking brake.
7. Rise off the operator's seat.

   Note: The engine should shut off if you are out of the operator's seat and the parking brake is disengaged.

Checking the Parking Brake and Traction Pedal Run-Interlock

1. Sit in the operator's seat.
2. Engage the parking brake.
3. Press the cutting unit drive switch to the DISENGAGE position.
4. Keep you foot off the traction pedal.
5. Start the engine.
6. Press the traction pedal.

   Note: The engine should shut off if the parking brake is ENGAGED and the traction pedal is pressed.

Checking the Seat and Traction Pedal Run-Interlock

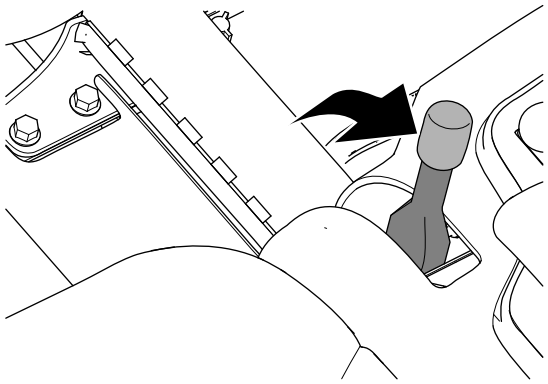
1. Sit in the operator's seat.
2. Engage the parking brake.
3. Press the cutting unit drive switch to the DISENGAGE position.
4. Keep you foot off the traction pedal.
5. Start the engine.
6. Disengage the parking brake.
7. Rise off the operator's seat.
8. Press the traction pedal.

   Note: The engine should shut off in 1 second if you are out of the operator's seat and press the traction pedal.

Checking the Parking Brake

Service Interval: Before each use or daily

1. Start the engine, raise the cutting units, disengage the parking brake, and move the machine to an open flat area.
2. Engage the parking brake (Figure 32).



g332418

Figure 32

3. Press the traction pedal to move the machine forward.

   Note: If the machine moves forward with the parking brake engaged, adjust parking brake; refer to Adjusting the Parking Brake (page 54).

   Note: Moving the machine forward with the parking brake engaged will cause the engine to shut off.

4. If you adjusted the parking brake, repeat steps 2 and 3.

   Note: If the machine moves forward with the parking brake engaged: service the parking brakes, check left and right brake linkage for damage, and check the brake lever pivot for damage; refer to Servicing the Parking Brakes (page 54).

5. Shut off the engine, remove the key, and wait for all moving parts to stop before leaving the operator's seat.

Adjusting the Seat

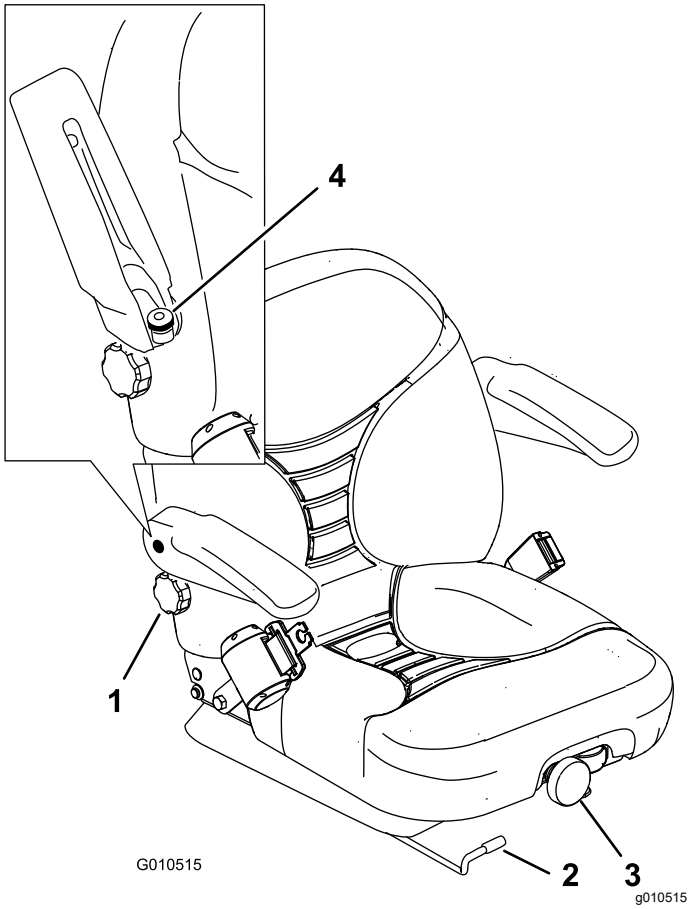


Figure 33

1. Backrest knob
2. Seat-position adjustment lever
3. Seat-suspension knob
4. Armrest-adjusting knob

Changing the Seat Position

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

1. Move the lever sideways to unlock the seat (Figure 33).
2. Slide the seat to the desired position and release the lever to lock it in position.

Changing the Seat Suspension

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

To adjust the seat, turn the front knob in either direction to provide the best comfort (Figure 33).

Changing the Back Position

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

To adjust the seat back, turn the knob under the right armrest, in either direction, to provide the best comfort (Figure 33).

Changing the Armrest Position

You can adjust the armrests to provide a comfortable ride. Position the armrests where they are most comfortable.

Raise the armrest and turn the knob, in either direction, to provide the best comfort (Figure 33).

During Operation

During Operation Safety

General Safety

- The owner/operator can prevent and is responsible for accidents that may cause personal injury or property damage.
- Wear appropriate clothing, including eye protection; long pants; substantial, slip-resistant footwear; and hearing protection. Tie back long hair and do not wear loose clothing or loose jewelry.
- Do not operate the machine while ill, tired, or under the influence of alcohol or drugs.
- Use your full attention while operating the machine. Do not engage in any activity that causes distractions; otherwise, injury or property damage may occur.
- Before you start the engine, ensure that all drives are in neutral, the parking brake is engaged, and you are in the operating position.
- Do not carry passengers on the machine and keep bystanders and children out of the operating area.
- Operate the machine only in good visibility to avoid holes or hidden hazards.
- Avoid mowing on wet grass. Reduced traction could cause the machine to slide.
- Keep your hands and feet away from the cutting units.
- Look behind and down before backing up to be sure of a clear path.
- Use care when approaching blind corners, shrubs, trees, or other objects that may obscure your vision.
- Stop the cutting units whenever you are not mowing.
- Slow down and use caution when making turns and crossing roads and sidewalks with the machine. Always yield the right-of-way.
- Operate the engine only in well-ventilated areas. Exhaust gases contain carbon monoxide, which is lethal if inhaled.
- Do not leave a running machine unattended.
- Before you leave the operator's position, do the following:
  - Park the machine on a level surface.
  - Disengage and lower the cutting units.
  - Engage the parking brake.
  - Shut off the engine and remove the key.
  - Wait for all movement to stop.
  - Allow the machine to cool before adjusting, servicing, cleaning, or storing it.
- Operate the machine only in good visibility and appropriate weather conditions. Do not operate the machine when there is the risk of lightning.
- Use the cruise control (if equipped) only when you can operate the machine in an open, flat area that is free from obstacles and where the machine can move at a constant speed without interruption.

Rollover Protection System (ROPS) Safety

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

Slope Safety

- Slopes are a major factor related to loss of control and rollover accidents, which can result in severe injury or death. You are responsible for safe slope operation. Operating the machine on any slope requires extra caution.
- Evaluate the site conditions to determine if the slope is safe for machine operation, including surveying the site. Always use common sense and good judgment when performing this survey.
- Review the slope instructions, listed below, for operating the machine on slopes. Before you operate the machine, review the site conditions to determine whether you can operate the machine in the conditions on that day and at that site. Changes in the terrain can result in a change in slope operation for the machine.
  - Avoid starting, stopping, or turning the machine on slopes. Avoid making sudden changes in speed or direction. Make turns slowly and gradually.
  - Do not operate a machine under any conditions where traction, steering, or stability is in question.
  - Remove or mark obstructions such as ditches, holes, ruts, bumps, rocks, or other hidden hazards. Tall grass can hide obstructions. Uneven terrain could overturn the machine.

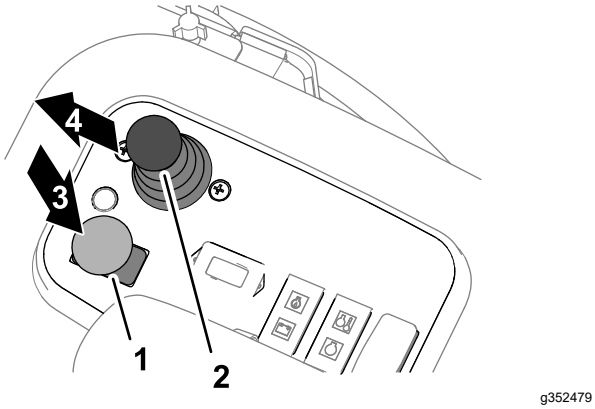
– Be aware that operating the machine on wet grass, across slopes, or downhill may cause the machine to lose traction.
– Use extreme caution when operating the machine near drop-offs, ditches, embankments, water hazards, or other hazards. The machine could suddenly roll over if a wheel goes over the edge or the edge caves in. Establish a safety area between the machine and any hazard.
– Identify hazards at the base of the slope. If there are hazards, mow the slope with a pedestrian-controlled machine.
– If possible, keep the cutting units lowered to the ground while operating on slopes. Raising the cutting units while operating on slopes can cause the machine to become unstable.

Starting the Engine

You may need to bleed the fuel system if any of the following situations have occurred; refer to Bleeding the Fuel System (page 36):

- You are starting the engine for the first time.
- The engine shut off because you ran the fuel tank empty.
- Someone performed fuel system maintenance, such as replacing the fuel filter.

1. Engage the parking brake and the press cutting unit drive switch to the DISENGAGE position (Figure 34).



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Figure 34

1. Cutting unit drive switch
2. Lower mow/raise control
3. Disengage
4. Lower

2. Remove your foot from the traction pedal and ensure that the pedal is in the NEUTRAL position.
3. Move the throttle lever to the 1/2 throttle position.
4. Insert the key into the switch and rotate it to the ON/PREHEAT position. Wait until the glow-plug indicator light shuts off (approximately 7 seconds).
5. Rotate the key to the START position to energize the starter motor; release the key when the engine starts.

   Important: **To prevent overheating of the starter motor, do not engage the starter for longer than 15 seconds. After 10 seconds of continuous cranking, wait 60 seconds before engaging the starter motor again.**
6. When you start the engine for the first time or after an overhaul of the engine, operate the machine in forward and reverse for 1 to 2 minutes. Also operate the lift lever and cutting unit drive switch to ensure proper operation of all traction and cutting unit systems.

   Turn the steering wheel to the left and right to check steering response; then shut off the engine and check for oil leaks, loose parts, and any other noticeable malfunctions.

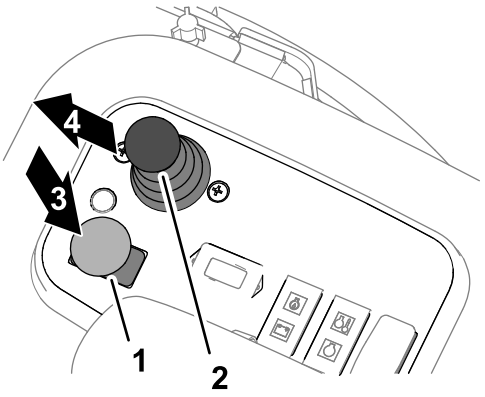
⚠ CAUTION

Contact with moving parts could result in injury.

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

Shutting Off the Engine

1. Move the throttle control to the IDLE position.
2. Engage the parking brake.
3. Move the cutting unit drive switch to DISENGAGE (Figure 35).

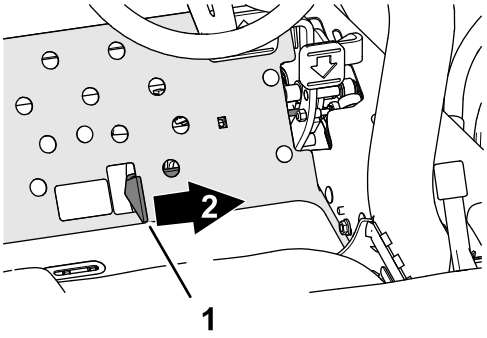


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Figure 35

1. Cutting unit drive switch
2. Lower mow/raise control
3. Disengage
4. Lower

4. Move the mow/transport slide right, to the MOW position (Figure 39).



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Figure 36

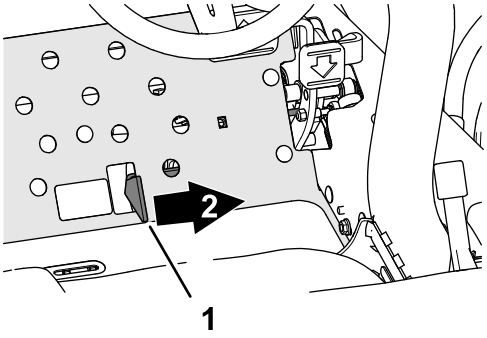
1. Mow/transport slid
2. Mow

5. Use the lower mow/raise control lever to lower the cutting units (Figure 35).
6. Shut off the engine, remove the key, and wait for all moving parts to stop.

Operating the Machine

Mowing Grass

1. Start the engine and move the throttle to the FAST position.
2. Move the mow/transport slide to the right to the MOW position (Figure 39).

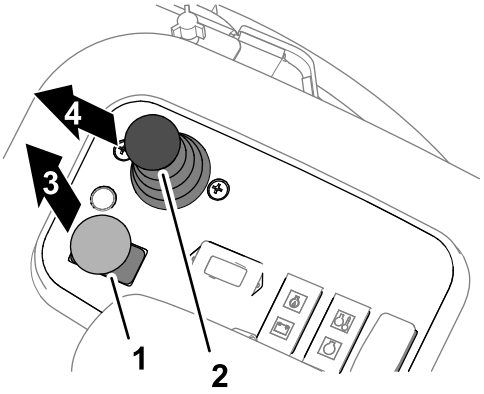


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Figure 37

1. Mow/transport slid
2. Mow

3. Press the cutting unit drive switch to the ENGAGE position (Figure 37).



g352636

Figure 38

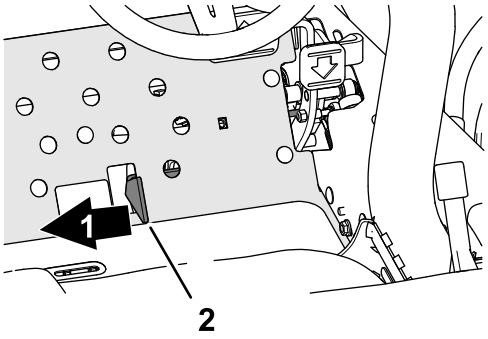
1. Cutting unit drive switch
2. Lower mow/raise control
3. Engage
4. Lower

4. Push the lower mow/raise lever forward (Figure 37) to lower and run the cutting units (the front cutting units are timed to lower before the rear cutting units).
5. Press the traction pedal forward to drive forward and cut grass.
6. Momentarily pull the lower mow/raise lever to raise the cutting units at the end of a cutting pass so that you can align the machine for the next cutting pass.

   Note: Push the lower mow/raise lever forward again to lower and run the cutting units.

Driving the Machine in Transport Mode

1. Move the cutting unit drive switch to the DISENGAGE position.
2. Raise the cutting units to the transport position.
3. Move the mow/transport slide left to the TRANSPORT position.



g352480

Figure 39

1. Transport
2. Mow/transport slid

Important: **Be careful when driving between objects so that you do not accidentally damage**

the machine or the cutting units. Use extra care when operating the machine on slopes. Drive slowly and avoid sharp turns on slopes to prevent rollovers.

Note: You cannot lower the cutting units while operating the machine the transport mode.

Clip Rate (Reel Speed)

To achieve a consistent, high quality of cut and a uniform after-cut appearance, it is important to match the reel speed to the height of cut.

Important: **If the reel speed is too slow, you may notice visible clip marks. If the reel speed is too fast, the cut may have a fuzzy appearance.**

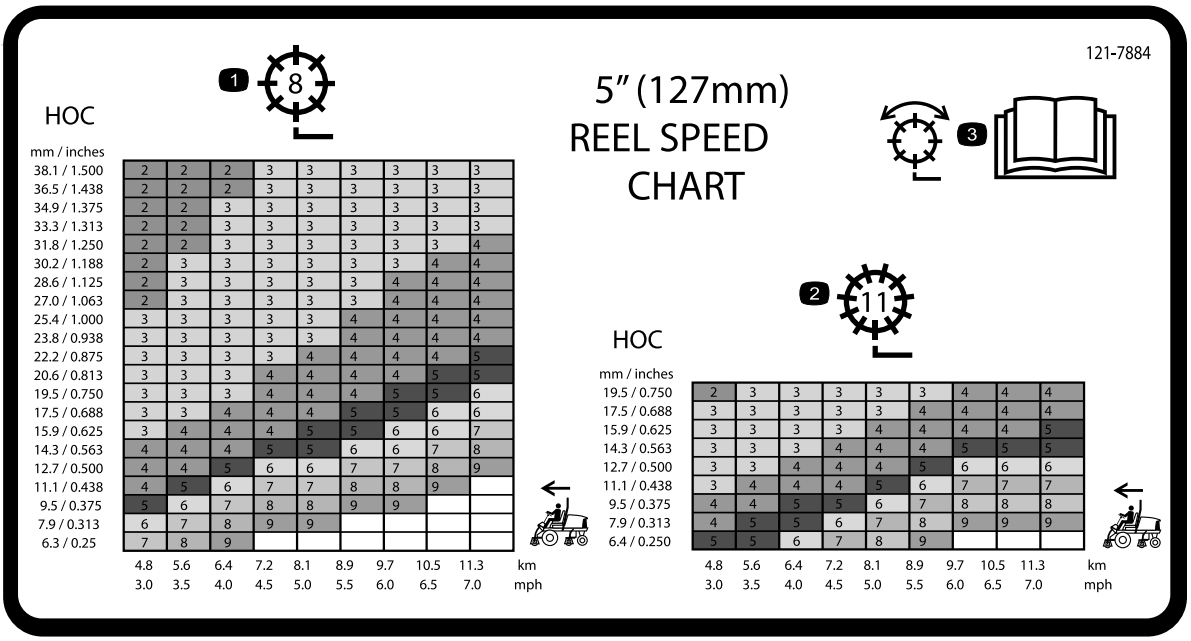


Figure 40

Models 03820 and 03910

1. 8-blade reel adjustment
2. 11-blade reel adjustment
3. Read the *Operator's Manual* for information on adjusting the reel.

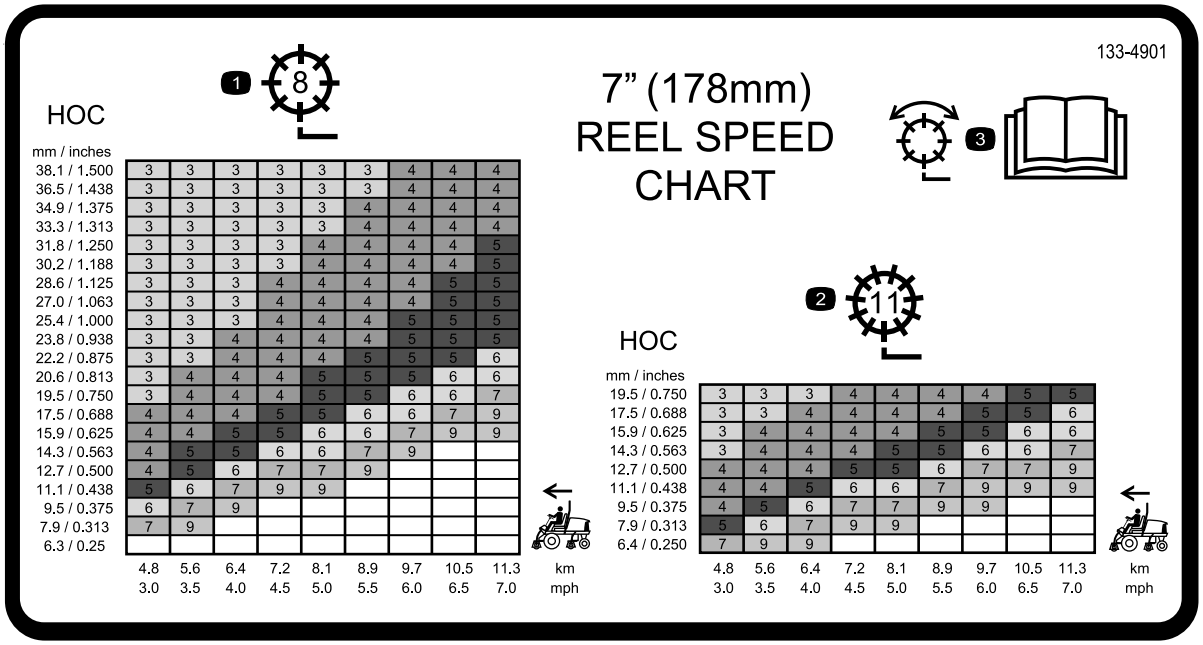


Figure 41

Model 03821

1. 8-blade reel adjustment
2. 11-blade reel adjustment
3. Read the *Operator’s Manual* for information on adjusting the reel.

Setting the Reel Speed

To achieve a consistent, high quality of cut and a uniform after-cut appearance, you must set the reel speed controls (located under the seat) correctly.

1. Select the height of cut at which the cutting units are set.
2. Choose the desired ground speed best suited for conditions.
3. Use the graph on the reel speed chart decals (Figure 40 and Figure 41), to determine the proper reel speed setting.

   Note: Take note of the reel-speed number.
4. Open the platform cover (Figure 42).

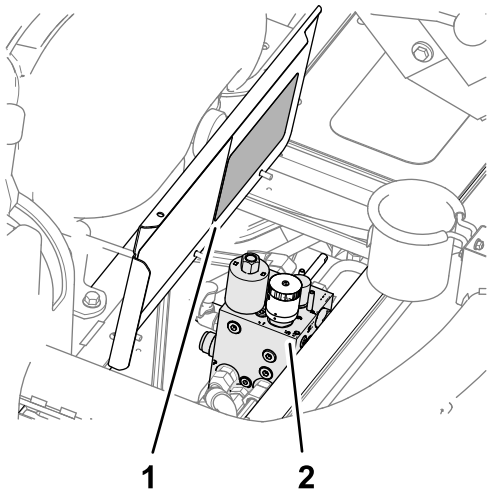


Figure 42

1. Reel speed chart decal (platform cover)
2. Mower manifold

5. Rotate the knob (Figure 43) of the mower manifold until the indicator arrow is in line with the reel-speed number that you determined in step 3.

   Note: You can increase or decrease the reel speed to compensate for turf conditions. When using baskets, increase the reel speed to improve collection performance.

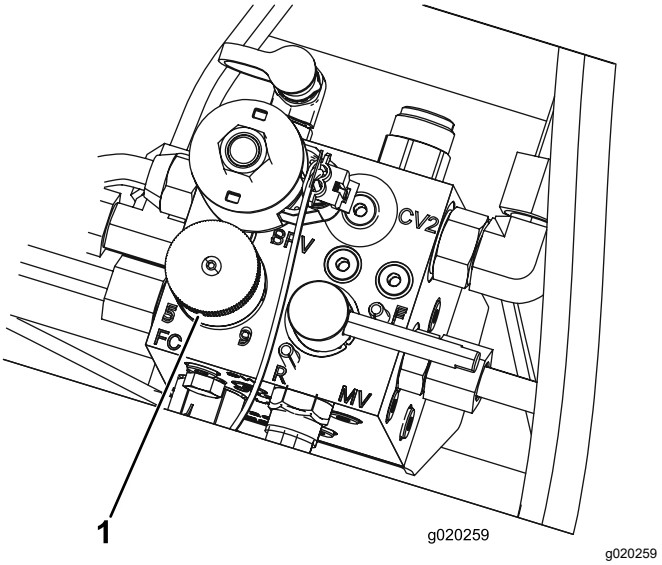


Figure 43

1. Reel speed control knob

6. Close the platform cover.

Adjusting the Lift-Arm Counterbalance

For Models 03820 and 03821 Only

You can adjust the counterbalance on the lift arms of the rear cutting units to compensate for different turf conditions and to maintain a uniform height of cut in 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 counterbalance (fourth position).

1. Park the machine on a level surface, lower the cutting units, engage the parking brake, shut off the engine, and remove the key from the ignition switch.
2. Insert a tube or similar object onto the long spring end to relieve the spring tension during the adjustment (Figure 44).

⚠ CAUTION

The springs are under tension and could cause personal injury.

Use caution when adjusting the spring tension.

3. While relieving the spring tension, remove the bolt and locknut securing the spring actuator to the bracket (Figure 44).

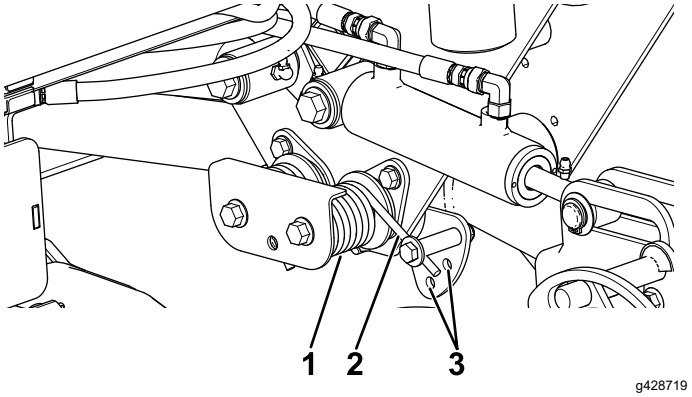


Figure 44

1. Spring
2. Spring actuator
3. Additional hole locations

4. Move the spring actuator to the desired hole location and secure it with the bolt and the locknut.
5. Repeat the procedure on the remaining spring.

Adjusting the Lift-Arm Down Pressure

You can adjust the configuration of the springs on the lift arms of the rear cutting units to provide down pressure. This is to compensate for different turf conditions where more downward force is needed.

To change to the down pressure configuration, the catch plate must be removed in order to switch the two springs from one side and the short leg of spring must now ride up against the top lip of the catch assembly (Figure 45).

You can adjust the downward pressure spring to 1 of 4 settings. Each increment increases or decreases down pressure 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 down pressure (fourth position).

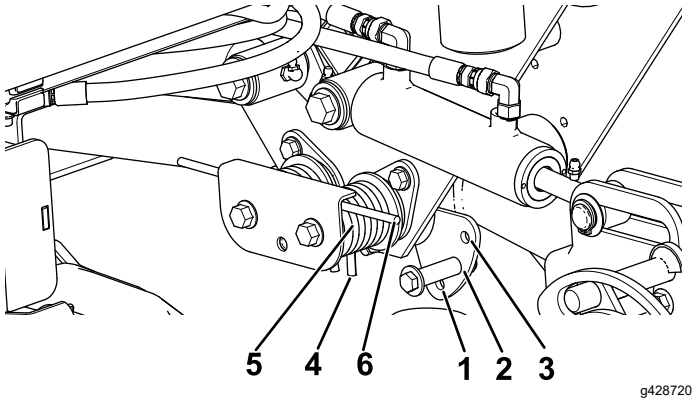


Figure 45

1. Position 1
2. Position 2
3. Position 3
4. Position 4
5. Spring
6. Spring actuator

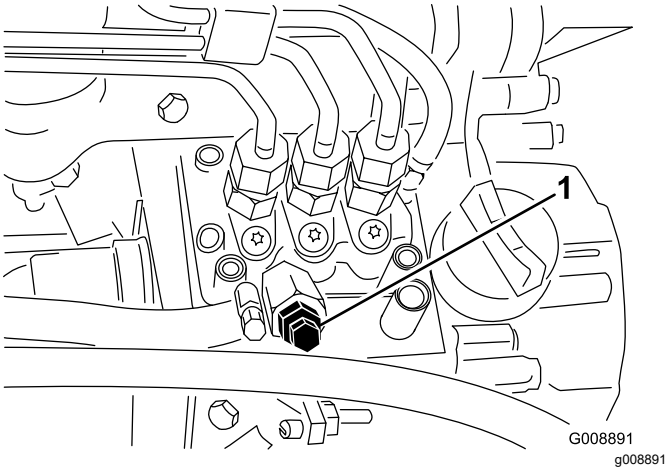


Figure 46

1. Fuel-injection pump bleed screw

1. Park the machine on a level surface, lower the cutting units, engage the parking brake, shut off the engine, and remove the key from the ignition switch.
2. Insert a tube or similar object onto the long spring end to relieve the spring tension during the adjustment (Figure 45).

⚠ CAUTION

The springs are under tension and could cause personal injury.

Use caution when adjusting the spring tension.

3. While relieving the spring tension, remove the bolt and locknut securing the spring actuator to the bracket (Figure 45)
4. Move the spring actuator to the desired hole location and secure it with the bolt and the locknut.
5. Repeat the procedure on the remaining spring.

Bleeding the Fuel System

1. Park the machine on a level surface, lower the cutting units, engage the parking brake, shut off the engine, and remove the key.
2. Ensure that the fuel tank is at least half full.
3. Unlatch and raise the hood.
4. Open the air-bleed screw on the fuel-injection pump (Figure 46).
5. Turn the key in the ignition switch to the ON position.

   The electric fuel pump runs, forcing air out around the air-bleed screw.

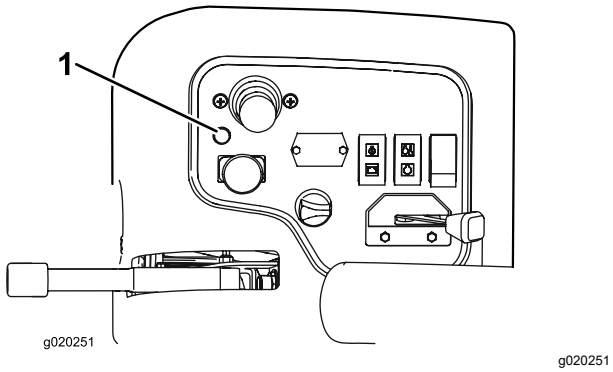
   Note: Leave the key in the ON position until a solid stream of fuel flows out around the screw.
6. Tighten the screw and turn the ignition key to OFF.

Note: The engine should start after you follow the procedure above. However, if the engine does not start, air may be trapped between the injection pump and injectors; refer to Bleeding Air from the Injectors (page 49).

Understanding the Diagnostic Light

The machine is equipped with a diagnostic light that indicates if the electronic controller senses an electronic fault. The diagnostic light is located on the control panel (Figure 47). When the electronic controller is functioning correctly and you move the key switch to the ON position, the controller diagnostic light turns on for 3 seconds and turn off to indicate that the light is working properly.

If the engine shuts off, the diagnostic light illuminates steady until the you change key position. The light blinks if the controller detects a fault in the electrical system. After you repair the fault, the light resets when you turn the key switch to the OFF position.



g020251

Figure 47

1. Diagnostic light

Operating Tips

Becoming Familiar with the Machine

Before mowing grass, practice operating the machine in an open area. Start and shut off the engine. Operate in forward and reverse. Lower and raise the cutting units and engage and disengage the cutting units. When you become more 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.

After Operation

After Operation Safety

General Safety

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

Towing the Machine

In case of an emergency, you can tow the machine for a short distance; however, Toro does not recommend this as a standard procedure.

Important: **Do not tow the machine faster than 3 to 4 km/h (2 to 3 mph) because it may damage the drive system. If you must move the machine a considerable distance, transport it on a truck or trailer.**

1. Unlatch and open the hood.
2. Near the right hood latch, rotate the bypass-valve handle on the pump 90° (Figure 48).

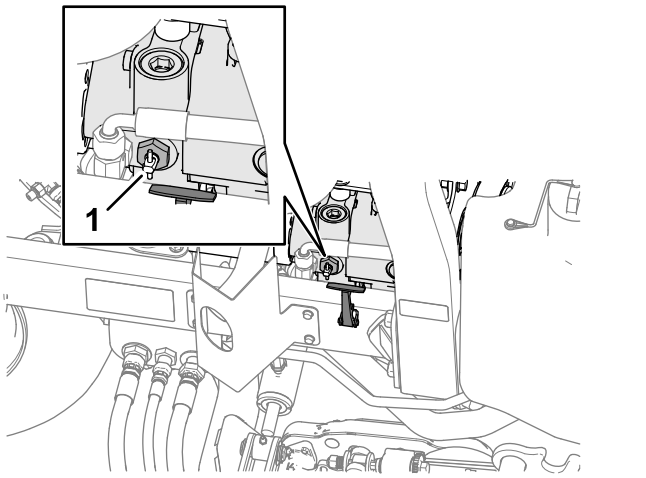


Figure 48

1. Bypass valve

3. Close and latch the hood.
4. Connect the tow vehicle to the machine at the tie-down points; refer to Identifying the Tie-Down Points (page 38).
5. Sit in the operator's seat, and if needed, use the parking brake to control your machine while being towed.

   Important: **Do not start the engine while the bypass valve is open.**
6. Before starting the engine, close the bypass valve by rotating it 90° (1/4 turn).

Identifying the Tie-Down Points

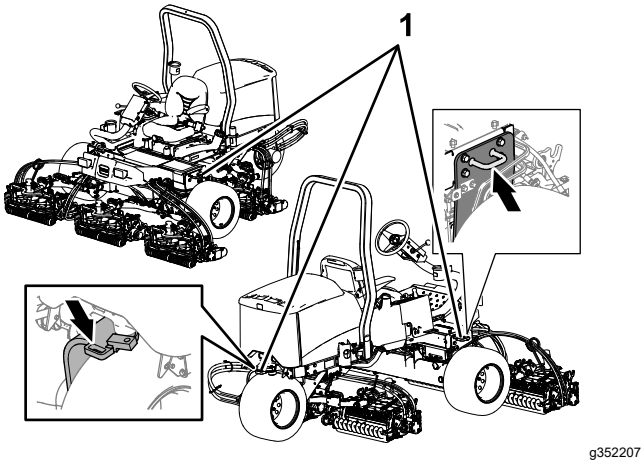


Figure 49

1. Tie-down loops

Hauling the Machine

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

Maintenance

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

Note: Download a free copy of the electrical or hydraulic schematic by visiting www.Toro.com and searching for your machine from the Manuals link on the home page.

Important: **Refer to your engine owner's manual and cutting unit *Operator's Manual* for additional maintenance procedures.**

Maintenance Safety

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

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first hour	• Torque the wheel lug nuts to 103 to 127 N·m (76 to 94 ft-lb). • Torque the left and right front axle hub nuts to 339 to 373 N·m (250 to 275 ft-lb). • Torque the rear axle hub nut to 339 to 373 N·m (250 to 275 ft-lb).
After the first 10 hours	• Torque the wheel lug nuts to 103 to 127 N·m (76 to 94 ft-lb). • Torque the left and right front axle hub nuts to 339 to 373 N·m (250 to 275 ft-lb). • Torque the rear axle hub nut to 339 to 373 N·m (250 to 275 ft-lb). • Check the condition and tension of all belts.
After the first 50 hours	• Change the oil and the oil filter.
Before each use or daily	• Inspect the seat belt(s) for wear, cuts, and other damage. Replace the seat belt(s) if any component does not operate properly. • Check the interlock switches. • Check the parking brake. • Check the engine-oil level. • Drain the water separator. • Check the tire pressure. • Check the engine-coolant level. • Clean the radiator and oil cooler. • Check the hydraulic lines and hoses. • Check the level of the hydraulic fluid. • Check the reel-to-bedknife contact.
Every 25 hours	• Check the electrolyte level (if machine is in storage, check every 30 days).
Every 50 hours	• Lubricate all bearings and bushings (daily when conditions are dusty and dirty).

Maintenance Service Interval	Maintenance Procedure
Every 100 hours	• Check the condition and tension of all belts.
Every 150 hours	• Change the oil and the oil filter.
Every 200 hours	• Service the air cleaner (more frequently in extreme dusty or dirty conditions). • Torque the wheel lug nuts to 103 to 127 N·m (76 to 94 ft-lb). • Torque the left and right front axle hub nuts to 339 to 373 N·m (250 to 275 ft-lb). • Torque the rear axle hub nut to 339 to 373 N·m (250 to 275 ft-lb). • Check the adjustment of the parking brake.
Every 400 hours	• Check the fuel lines and connections. • Replace the fuel filter canister. • Service the parking brakes.
Every 800 hours	• If you are not using the recommended hydraulic fluid or have ever filled the reservoir with an alternative fluid, change the hydraulic fluid. • If you are not using the recommended hydraulic fluid or have ever filled the reservoir with an alternative fluid, replace the hydraulic filter.
Every 1,000 hours	• If you are using the recommended hydraulic fluid, replace the hydraulic filter.
Every 2,000 hours	• If you are using the recommended hydraulic fluid, change the hydraulic fluid.
Every 2 years	• Drain and clean the fuel tank. • Drain and flush the coolant system (take the machine to an Authorized Service Dealer or Distributor or refer to the Service Manual).

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 level.							
Check the cooling system fluid level.							
Drain the water/fuel separator.							
Check the air filter, dust cup, and burp valve.							
Check for unusual engine noises.[1]							
Check the radiator for debris.							
Check for unusual operating noises.							
Check the hydraulic system fluid level.							
Check the hydraulic hoses for damage.							
Check for fluid leaks.							
Check the fuel level.							
Check the tire pressure.							
Check the instrument operation.							
Check the height-of-cut adjustment.							
Lubricate all the grease fittings.[2]							
Touch-up any damaged paint.							
Wash the machine.							

[1]Check the glow plug and injector nozzles if starting is hard, there is excess smoke, or rough running is noted.

[2]Immediately **after every** washing, regardless of the interval listed.

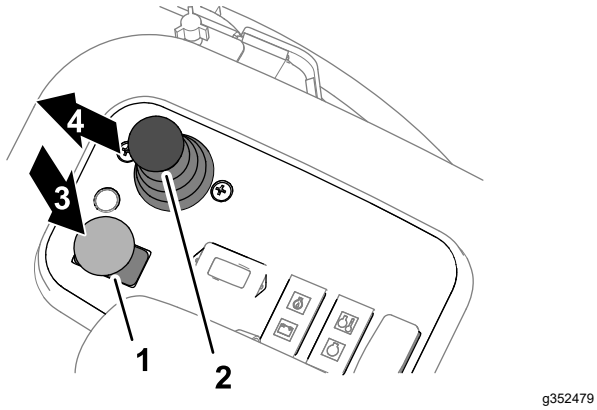
Notation for Areas of Concern

Inspection performed by:		
Item	**Date**	**Information**
1		
2		
3		
4		
5		

Pre-Maintenance Procedures

Preparing for Maintenance

1. Park the machine on a level surface.
2. Engage the parking brake.
3. Press the cutting unit drive switch to the DISENGAGE position (Figure 50).

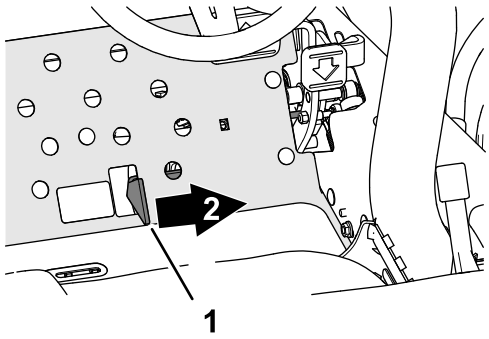


g352479

Figure 50

1. Cutting unit drive switch
2. Lower mow/raise control
3. Engage
4. Disengage
5. Lower
6. Raise

4. Move the mow/transport slide right, to the MOW position.



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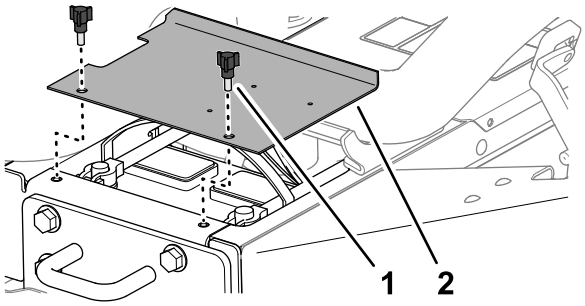
Figure 51

1. Mow/transport slid
2. Mow

5. Move the lower mow/raise control lever forward (Figure 50).
6. Shut off the engine, and remove the key.
7. Wait for all parts to stop moving.

Removing the Battery Cover

Remove the 2 knobs that secure the battery cover to the machine, and remove the cover (Figure 49).



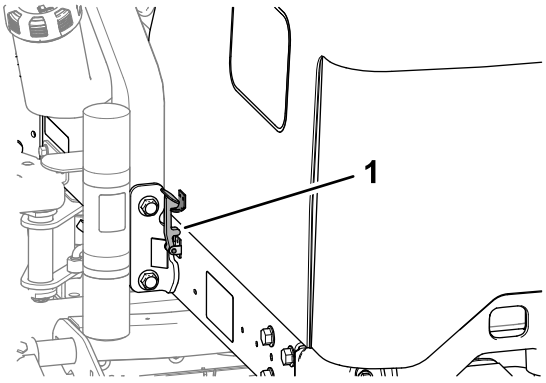
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Figure 52

1. Knob
2. Battery cover

Opening the Hood

1. Release the latches at the left side and right side of the hood (Figure 52).

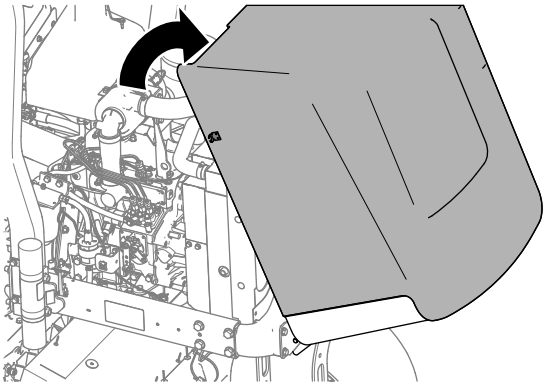


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Figure 53

1. Hood latch

2. Rotate the hood up and back (Figure 53).



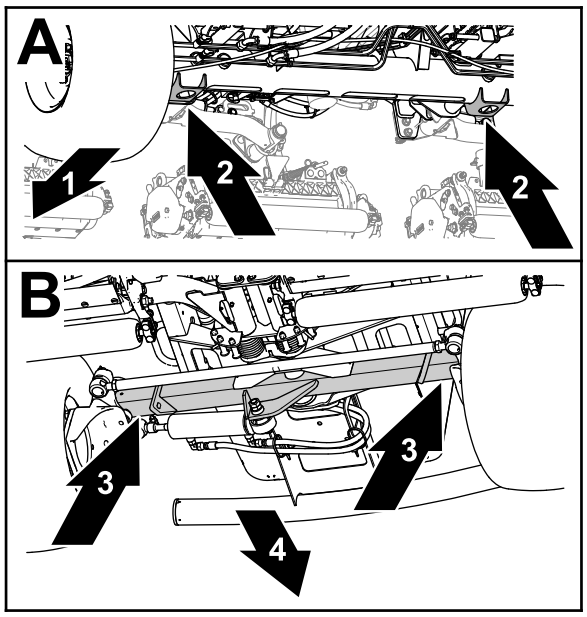
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Figure 54

Jacking Point Locations

Note: Support the machine with jack stands whenever you work under the machine; refer to Maintenance Safety (page 39).

Use the following as machine-lift points:



g375763

Figure 55

1. Front of the machine
2. Jack brackets (front-axle tube)
3. Rear-axle tube
4. Back of the machine

- Front—the jack brackets of the front-axle tube (Figure 55).
- Rear—the rear-axle tube.

Lubrication

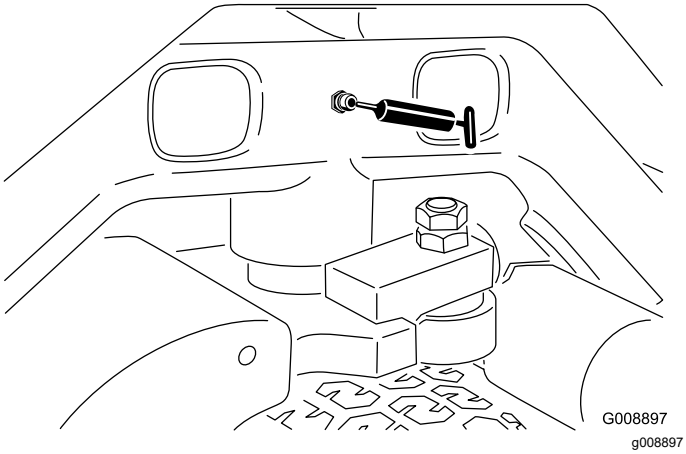
Greasing the Bearings and Bushings

Service Interval: Every 50 hours (daily when conditions are dusty and dirty).

Grease Specification: No. 2 lithium grease

The machine has grease fittings that you must lubricate regularly. Dusty and dirty operating conditions could cause dirt to get into the bearings and bushings, resulting in accelerated wear. Lubricate the grease fittings immediately after every washing, regardless of the interval specified.

1. Prepare the machine for maintenance; refer to Preparing for Maintenance (page 42).
2. Grease fittings at the locations and for quantities are as follows:
   - Steering pivot (Figure 56)

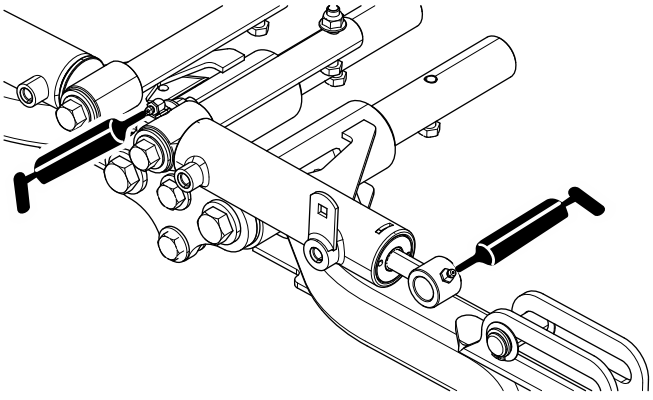


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Figure 56

   - Front lift-arm pivots and lift cylinders (3 each); refer to Figure 57.

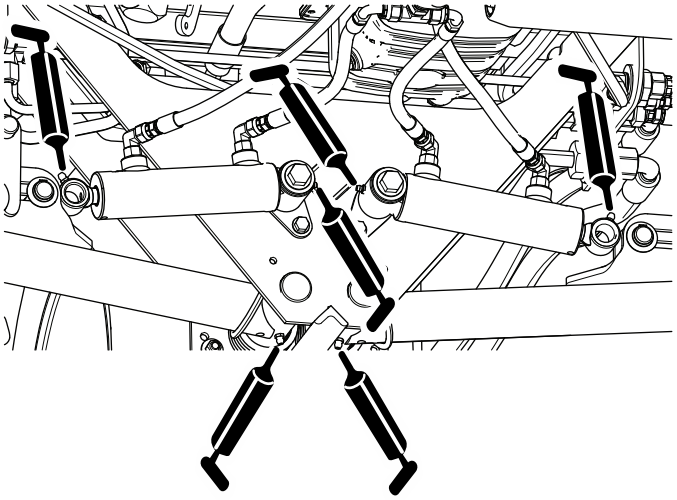


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Figure 57

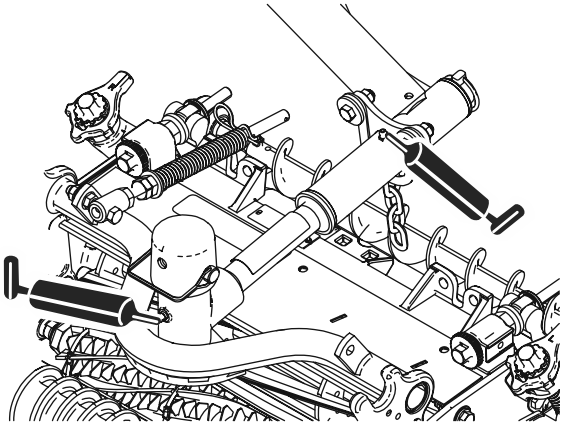
- Rear lift-arm pivots and lift cylinders (3 each side); refer to Figure 58.



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Figure 58

- Cutting unit pivots (2 each); refer to Figure 59.

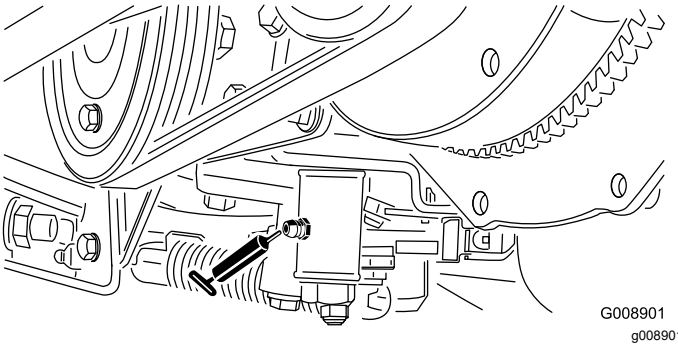


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g020393

Figure 59

- Neutral adjust mechanism (Figure 60)

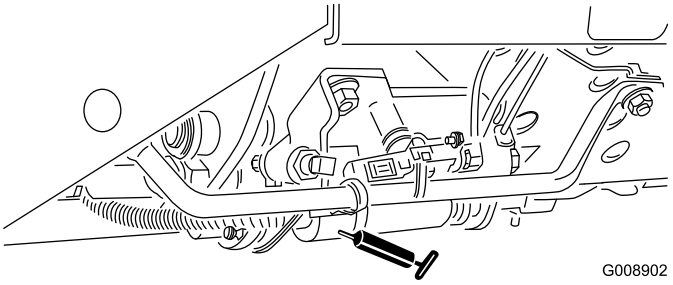


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Figure 60

- Mow/transport slide (Figure 61)

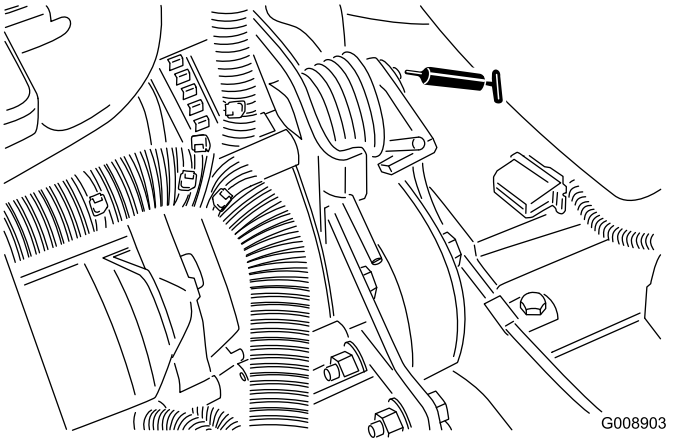


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g008902

Figure 61

- Belt tension pivot (Figure 62)



G008903

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Figure 62

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.

Engine Oil Specification

Use high-quality, low-ash engine oil that meets or exceeds the following specifications:

Service Category

ACEA—E6
API—CH-4 or higher
JASO—DH-2

Preferred oil viscosity: SAE 15W-40 [-17ºC (above 0°F)]

Alternate oil viscosity: SAE 10W-30 or 5W-30 (all temperatures)

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

Checking the Engine-Oil Level

Service Interval: Before each use or daily

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

Note: Toro Premium Engine oil is available from a distributor in either 15W-40 or 10W-30 viscosity. See the parts catalog for part numbers.

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

1. Prepare the machine for maintenance; refer to Preparing for Maintenance (page 42).
2. Unlatch and open the hood.
3. Remove the dipstick (Figure 63) and wipe it with a clean rag.

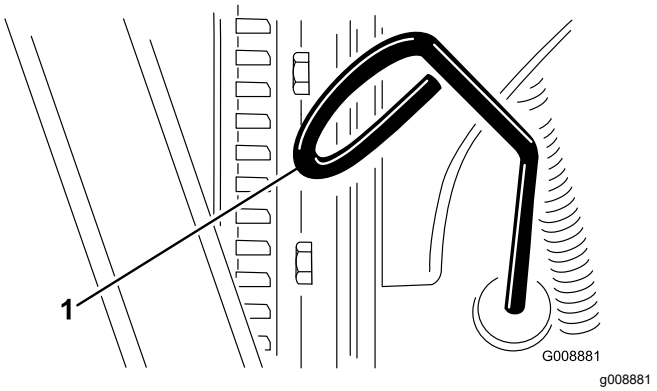


Figure 63

1. Dipstick

4. Push the dipstick down into the dipstick tube and ensure that it is seated fully, then pull the dipstick out and check the oil level.
5. If the oil level is low, remove the oil-fill cap (Figure 64) and gradually add small quantities of oil, checking the level frequently, until the level reaches the Full mark on the dipstick.

   Important: **Keep the engine-oil level between the upper and lower limits on the dipstick. Overfilling or underfilling the engine oil may cause severe engine damage.**

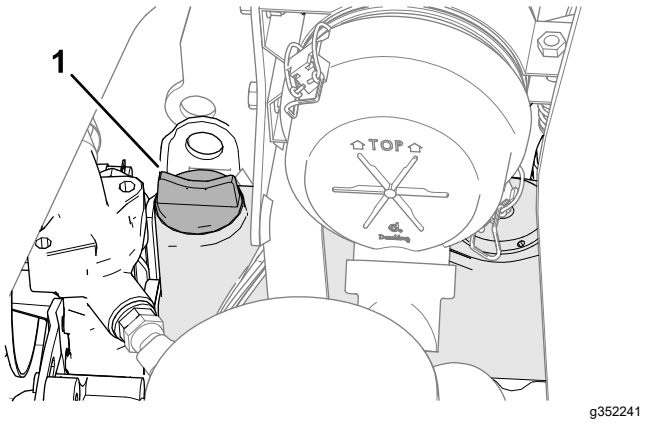


Figure 64

1. Oil-fill cap

6. Install the oil-fill cap and dipstick.
7. Close and latch the hood.

Changing the Engine Oil and the Filter

Service Interval: After the first 50 hours

Every 150 hours

Crankcase capacity: approximately 3.8 L (4.0 US qt) with the filter

1. Prepare the machine for maintenance; refer to Preparing for Maintenance (page 42).
2. Unlatch and open the hood, and wait for the engine to cool.
3. Remove either drain plug (Figure 65) and let the oil flow into a drain pan; when the oil stops flowing, install the drain plug.

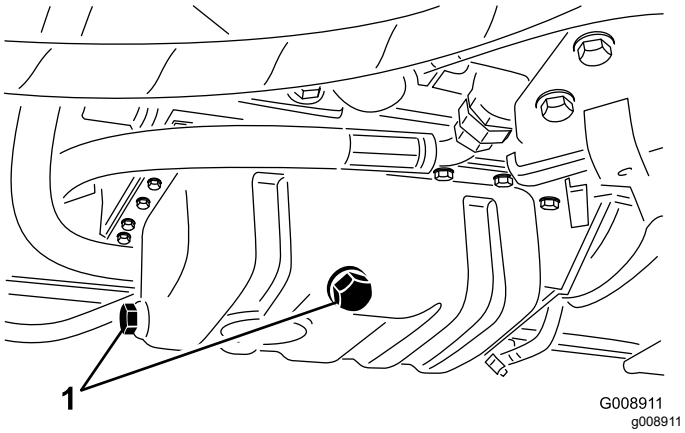


Figure 65

1. Drain plugs

4. Remove the oil filter (Figure 66).

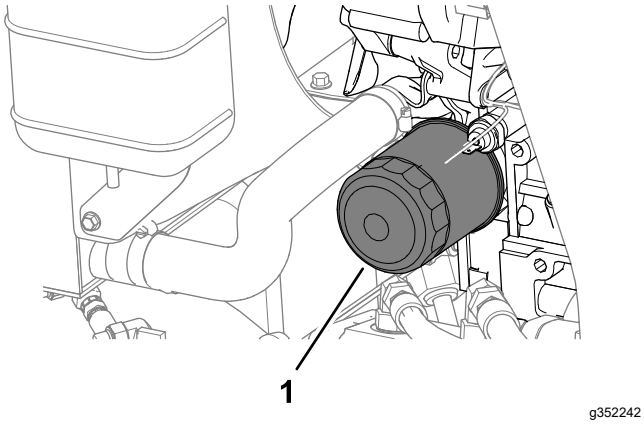


Figure 66

1. Oil filter

5. Apply a light coat of clean oil to the new filter seal and install the oil filter.

   Note: Do not overtighten the filter.

6. Add oil to the crankcase; refer to Engine Oil Specification (page 45) and Checking the Engine-Oil Level (page 45).
7. Close and latch the hood.

Servicing the Air Cleaner

Service Interval: Every 200 hours (more frequently in extreme dusty or dirty conditions).

Removing the Air Filter

- Check the air cleaner body for damage which 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 at the recommended service interval or earlier if engine performance declines due to extremely dusty, dirty conditions. Changing the air filter before it is necessary only increases the chance of dirt entering the engine when the filter is removed.
- Ensure that the cover is seated correctly and seals with the air-cleaner body.

1. Prepare the machine for maintenance; refer to Preparing for Maintenance (page 42).
2. Open the hood.
3. Release the latches that secure the air-cleaner cover to the air-cleaner body (Figure 67).

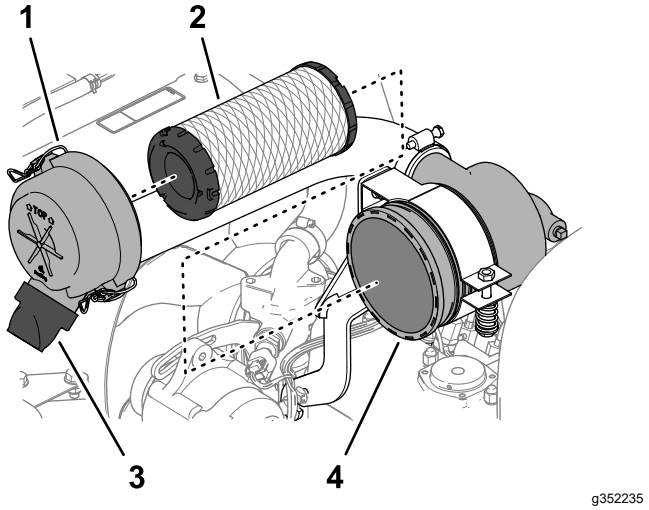


Figure 67

1. Air-cleaner cover
2. Filter element
3. Rubber outlet valve (dirt ejection port)
4. Air-cleaner body

4. Remove the cover from the air-cleaner body.

5. Before removing the filter, use low-pressure air—276 kPa (40 psi), clean and dry—to help remove large accumulations of debris packed between the outside of primary 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 you remove the primary filter.
6. Remove the filter element (Figure 67).

   Note: Cleaning the used element may damage the filter media.
7. Remove the rubber outlet valve (Figure 67) from the dirt ejection port of the air-cleaner cover.
8. Clean the ejection and outlet valve, and install the outlet valve to the port.

Installing the Air Filter

1. Inspect the new filter for shipping damage and check the sealing end of the filter and the body.

   Important: **Do not use a damaged element.**
2. Insert the new filter by applying pressure to the outer rim of the element to seat it in the canister.

   Important: **Do not apply pressure to the flexible center of the filter.**
3. 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.
4. Secure the cover with the 2 latches.
5. Close and latch the hood.

Fuel System Maintenance

Fuel Maintenance

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

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

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

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

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

Storing Fuel

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

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

provider to correct the problem and perform all fuel system maintenance.

- Do not store diesel fuel in tanks or canisters made with zinc-plated components.

Servicing the Fuel Tank

Service Interval: Every 2 years—Drain and clean the fuel tank.

Prepare the machine for maintenance; refer to Preparing for Maintenance (page 42).

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

Inspecting the Fuel Lines and Fittings

Service Interval: Every 400 hours/Yearly (whichever comes first)

1. Prepare the machine for maintenance; refer to Preparing for Maintenance (page 42).
2. Unlatch and open the hood.
3. Inspect the fuel lines and fittings for deterioration, damage, or loose connections.

   Note: Repair or replace any damaged or worn the fuel lines or fittings.
4. Close and latch the hood.

Draining the Water Separator

Service Interval: Before each use or daily

1. Prepare the machine for maintenance; refer to Preparing for Maintenance (page 42).
2. Unlatch and open the hood, and wait for the engine to cool.
3. Place a clean container under the fuel filter.
4. Loosen the drain valve on the bottom of the filter canister (Figure 68).

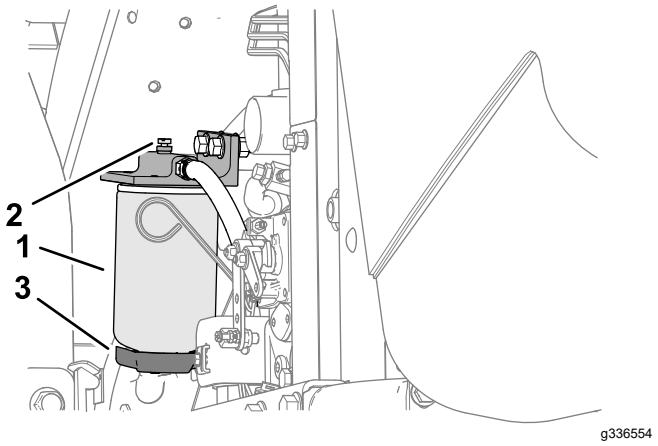


Figure 68

1. Water separator/filter canister
2. Vent plug
3. Drain valve

5. Tighten the valve after draining.
6. Start the engine, check for leaks, and shut off the engine.

   Note: Repair all fuel leaks.
7. Close and latch the hood.

Changing the Fuel Filter Canister

Service Interval: Every 400 hours

1. Prepare the machine for maintenance; refer to Preparing for Maintenance (page 42).
2. Unlatch and open the hood, and wait for the engine to cool.
3. Clean the area where the filter canister mounts (Figure 68).
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 the mounting surface; then rotate an additional 1/2 turn.
7. Start the engine, check for leaks, and shut off the engine.

   Note: Repair all fuel leaks.
8. Close and latch the hood.

Bleeding Air from the Injectors

Note: Use this procedure only if the fuel system has been purged of air through normal priming procedures and the engine does not start; refer to Bleeding the Fuel System (page 36).

1. When possible, preform each step in Preparing for Maintenance (page 42).
2. Unlatch and open the hood, and if the engine is hot wait for it to cool.
3. Loosen the tube nut for the fuel line to the No. 1 fuel-injector nozzle.

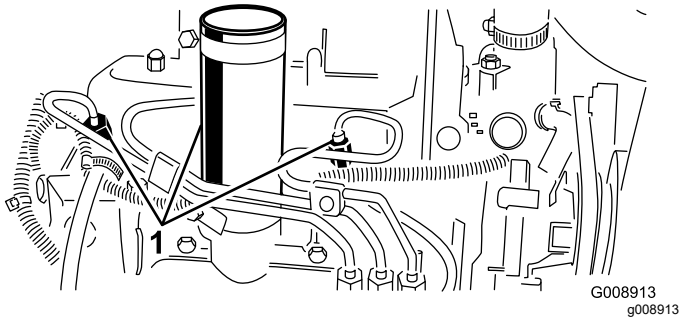


Figure 69

1. Fuel injectors

4. Move the throttle to the FAST position.
5. Turn the key in the key switch to the START position and watch the fuel flow around the connector. Turn the key to the OFF position when there is a continuous flow.

   Important: **To prevent overheating of the starter motor, do not engage the starter for longer than 15 seconds. After 10 seconds of continuous cranking, wait 60 seconds before engaging the starter motor again.**
6. Tighten the tube nut securely.
7. Clean any fuel from the engine.
8. Repeat steps 3 through 7 for the remaining fuel-injector nozzles.
9. Start the engine, check for leaks, and shut off the engine.

   Note: Repair all fuel leaks.
10. Close and latch the hood.

Electrical System Maintenance

Electrical System Safety

- Disconnect the battery before repairing the machine. Disconnect the negative terminal first and the positive last. Connect the positive terminal first and the negative last.
- 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 25 hours—Check the electrolyte level (if machine is in storage, check every 30 days).

⚠ DANGER

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

- **Do not drink electrolyte and avoid contact with your skin, eyes, or clothing. Wear eye protection and rubber gloves.**
- **Fill the battery where clean water is always available for flushing the skin.**

⚠ WARNING

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

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

1. Prepare the machine for maintenance; refer to Preparing for Maintenance (page 42).
2. Remove the battery cover; refer to Removing the Battery Cover (page 42).
3. Remove the filler caps of the battery.
4. Maintain the battery electrolyte level in the battery cells with distilled or demineralized water.

Note: Do not fill the cells above the bottom of the split ring inside each cell.

5. Install the filler caps with the vents pointing to the rear (toward the fuel tank).
6. Clean the top of the battery by washing it periodically with a brush dipped in ammonia or bicarbonate of soda solution. Flush the top surface with water after cleaning.

   Important: **Do not remove the filler caps while cleaning.**
7. Check the battery cable clamps and battery posts for corrosion. If corrosion occurs, perform the following:
   A. Disconnect the negative (–) battery cable.
   B. Disconnect the positive (+) battery cable.
   C. Clean the clamps and posts separately.
   D. Connect the positive (+) battery cable.
   E. Connect the negative (–) battery cable.
   F. Coat the clamps and terminals with battery terminal protector.
8. Check that the battery cable clamps are tight on the battery posts.
9. Install the battery cover.

Note: Store the machine where the temperature is cooler rather than warmer to prevent the battery from discharging more rapidly.

Fuses

Servicing the Fuse Block

1. Lift the cover from the control arm (Figure 70).

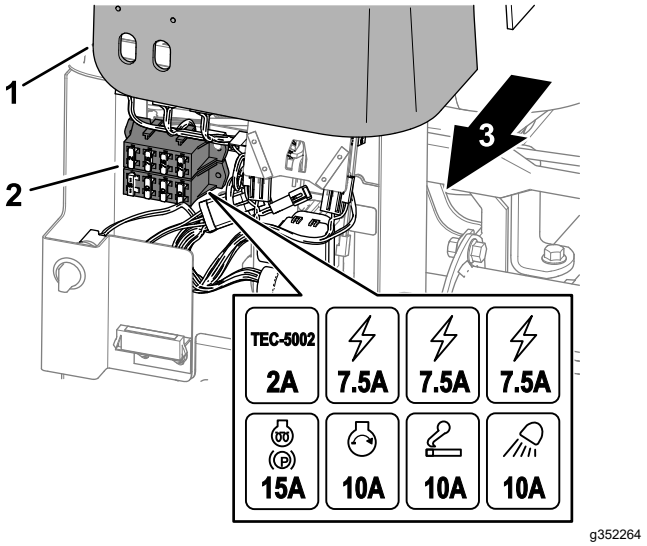


Figure 70

1. Control-arm cover
2. Fuse block
3. Right side of the machine

2. Locate the open fuse in the fuse holder or fuse block (Figure 70).
3. Replace the fuse with the same type and amperage fuse.
4. Assemble the cover onto the control arm (Figure 70).

Servicing the Telematics Fuse

1. Remove the battery cover; Removing the Battery Cover (page 42).
2. Remove the cap from the in-line fuse holder (Figure 71).

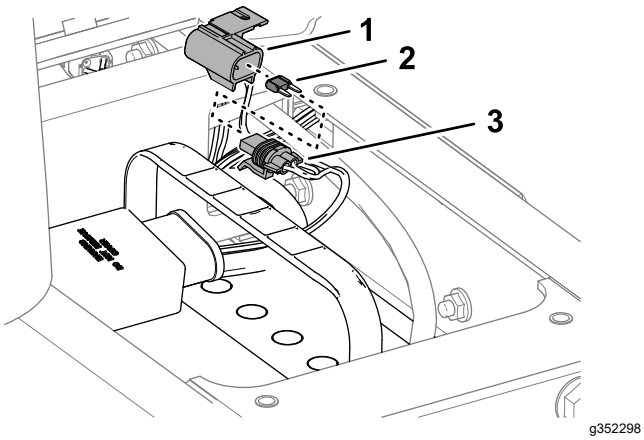


Figure 71

1. Cap
2. Fuse (10 A)
3. Fuse holder

3. Replace the fuse (10 A).
4. Assemble the cap onto the in-line fuse holder.
5. Install the battery cover.

Drive System Maintenance

Checking the Tire Pressure

Service Interval: Before each use or daily

⚠ DANGER

Low tire pressure decreases machine side hill stability. This could cause a rollover, which may result in personal injury or death.

Do not under-inflate the tires.

Note: Maintain the recommended pressure in all tires to ensure a good quality of cut and proper machine performance.

1. Measure the air pressure in each tire. The correct air pressure in the tires is 83 kPa (12 psi).
2. If needed, add air to of remove air from the tires until you measure 83 kPa (12 psi).

Torquing the Wheel Lug Nuts

Service Interval: After the first hour

After the first 10 hours

Every 200 hours

Torque the wheel nuts to 103 to 127 N·m (76 to 94 ft-lb) in a crossing pattern.

⚠ WARNING

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

Maintain proper torque of the wheel nuts.

Torquing the Axle Hub Nuts

Service Interval: After the first hour

After the first 10 hours

Every 200 hours

Torque the axle hub nuts to 339 to 373 N·m (250 to 275 ft-lb).

Adjusting the Traction Drive for Neutral

If the machine moves when the traction pedal is in the NEUTRAL position, adjust the traction cam.

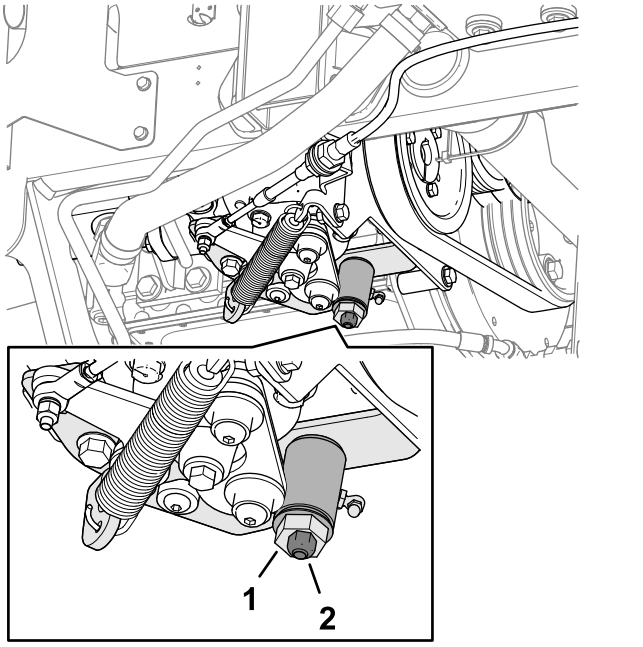
1. Park the machine on a level surface, lower the cutting units, engage the parking brake, shut off the engine, and remove the key from the ignition switch.
2. Raise a front wheel and a rear wheel off the floor and place support blocks under the frame.

⚠ WARNING

If the machine is not supported adequately, it may accidentally fall, injuring anyone under the machine.

Raise a front wheel *and* the rear wheel off the ground; otherwise, the machine will move during adjustment.

3. Loosen the locknut on the traction adjustment cam (Figure 72).



g352331

Figure 72

1. Traction adjustment cam 2. Locknut

⚠ WARNING

The engine must be running so that you can make a final adjustment of the traction adjustment cam. Contact with hot or moving parts can result in personal injury.

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

4. Start the engine and rotate the cam hex in both directions to determine the mid position of the neutral span.
5. Tighten the locknut securing the adjustment.
6. Shut off the engine.
7. Remove the support blocks and lower the machine to the shop floor. Test drive the machine to ensure that it does not move when the traction pedal is in neutral.

Cooling System Maintenance

Cooling System Safety

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

Coolant Specification

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

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

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

Coolant Type Table

Ethylene-Glycol Coolant Type	Corrosion Inhibitor Type
Extended-life antifreeze	Organic-acid technology (OAT)
Important: **Do not rely on the color of the coolant to identify the difference between conventional (green) inorganic-acid technology (IAT) coolant and extended-life coolant.** **Coolant manufacturers may dye extended-life coolant in one of the following colors: red, pink, orange, yellow, blue, teal, violet, and green. Use coolant that meets the specifications in the Extended Life Coolant Standards Table.**	

Extended Life Coolant Standards

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

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

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

Checking the Coolant Level

Service Interval: Before each use or daily

Cooling system capacity: approximately 5.7 L (6 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. Prepare the machine for maintenance; refer to Preparing for Maintenance (page 42).
2. Unlatch and open the hood.
3. Check the coolant level in the expansion tank (Figure 73).

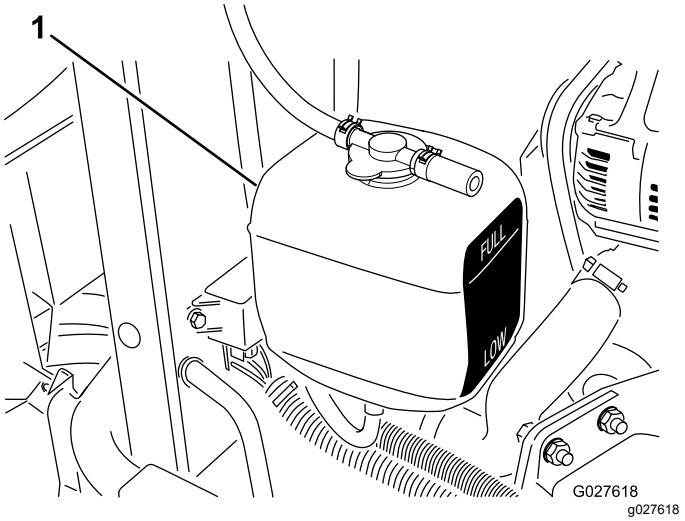


Figure 73

1. Expansion tank

Note: With a cold engine, the coolant level should be approximately midway between the marks on the side of the tank.

4. If the coolant level is low remove the expansion tank cap, add the specified coolant to the tank until the coolant level is midway between the

marks on the side of the tank, and assemble the cap to the tank.

Important: **Do not overfill the expansion tank.**

5. Close and latch the hood.

Cleaning the Engine Cooling System

Service Interval: Before each use or daily

Remove debris from the oil cooler and radiator daily. Clean them more frequently in dirty conditions.

1. Prepare the machine for maintenance; refer to Preparing for Maintenance (page 42).
2. Raise the hood.
3. Clean the engine area thoroughly of all debris.
4. Remove the lower radiator shield (Figure 74).

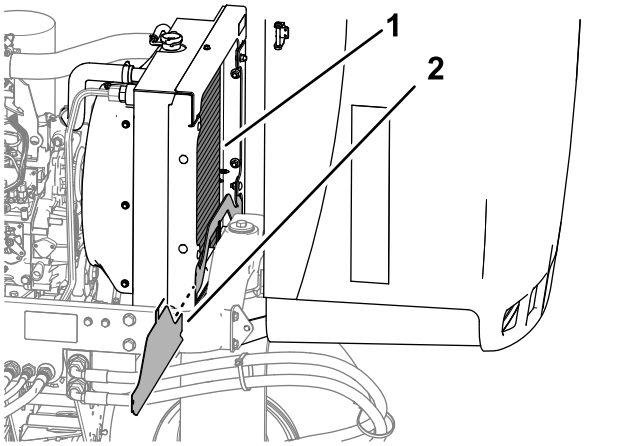


Figure 74

1. Radiator
2. Lower radiator shield

5. Clean both sides of the radiator area thoroughly with water or compressed air (Figure 74).
6. Install the lower radiator shield.
7. Close and latch the hood.

Brake Maintenance

Adjusting the Parking Brake

Service Interval: Every 200 hours—Check the adjustment of the parking brake.

1. Prepare the machine for maintenance; refer to Preparing for Maintenance (page 42).
2. Loosen the setscrew securing the knob to the parking-brake lever (Figure 75).

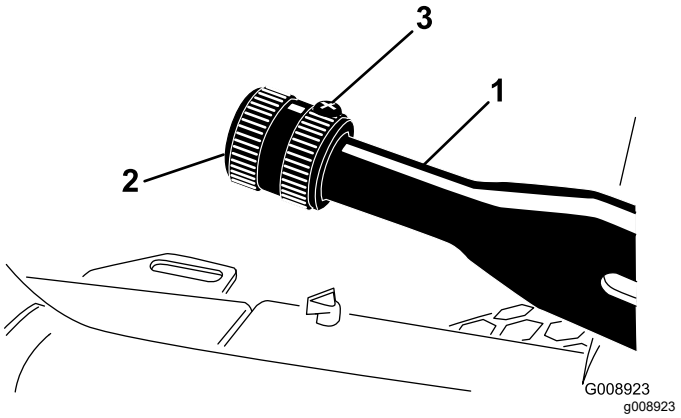


Figure 75

1. Parking-brake lever
2. Knob
3. Set screw

3. Rotate the knob until a force of 133 to 178 N (30 to 40 lb) is required to actuate the lever.
4. Tighten the setscrew.

Servicing the Parking Brakes

Service Interval: Every 400 hours

Preparing the Machine

1. Prepare the machine for maintenance; refer to Preparing for Maintenance (page 42).
2. Raise the front of machine.
3. Support the machine with jack stands rated for the weight of your machine; refer to Specifications (page 25).
4. Repeat steps 2 and 3 at the other side of the machine.

Removing the Front Wheels

1. Remove the 4 lug nuts that secure the front wheel to the hub, and remove the wheel (Figure 76).

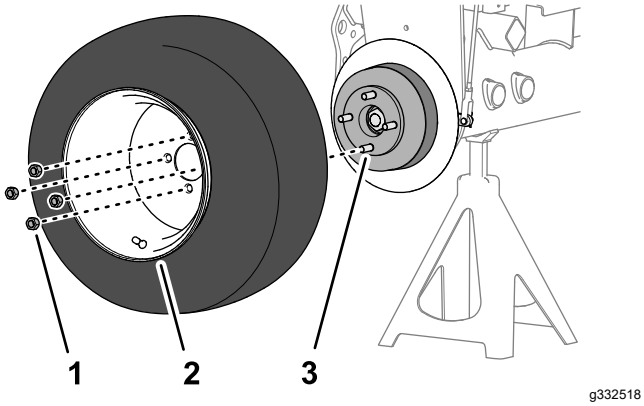


Figure 76

1. Lug nut
2. Wheel
3. Hub

2. Repeat step 1 at the other side of the machine.

Removing the Wheel Hub and Brake Drum

Special Tools: Wheel Hub Puller—Toro Part No. TOR4097

1. Remove the locknut that secures the hub to the wheel-motor shaft (Figure 77 or Figure 78).

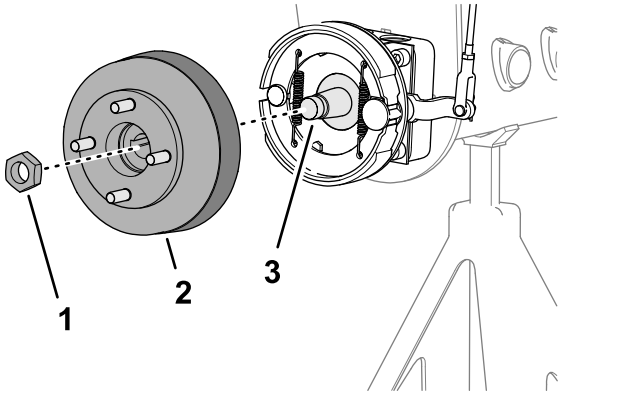


Figure 77

Machines without the Optional Grass Shield

1. Locknut
2. Hub and brake drum
3. Wheel-motor shaft

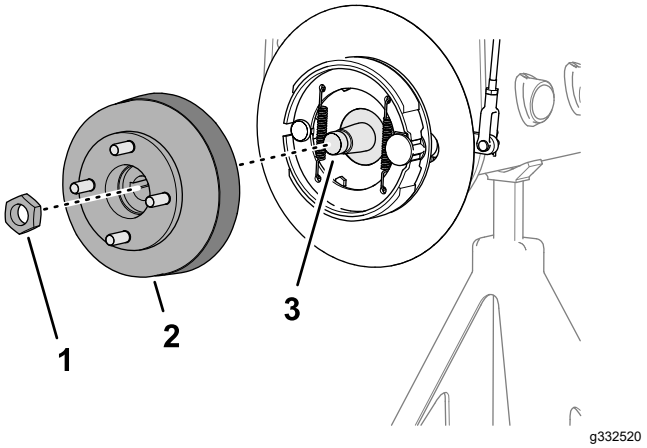


Figure 78

Machines with the Optional Grass Shield

1. Locknut
2. Hub and brake drum
3. Wheel-motor shaft

2. Repeat step 1 at the other side of the machine.
3. Release the parking brake.
4. Use the specified wheel hub puller to remove wheel hub and brake drum from the wheel-motor shaft (Figure 77 or Figure 78).
5. Remove woodruff key from the wheel-motor shaft (Figure 79).

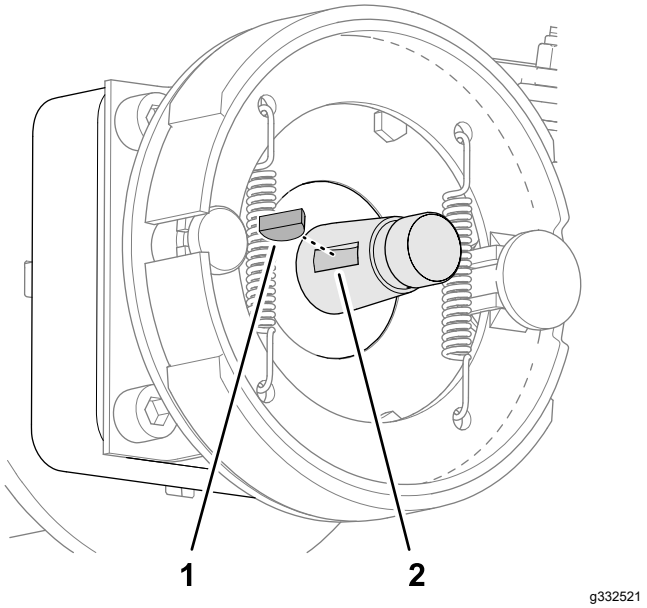


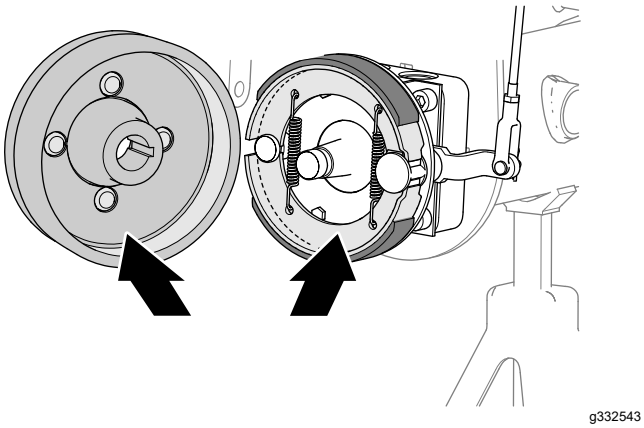
Figure 79

1. Woodruff key
2. Groove (wheel-motor shaft)

6. Repeat steps 4 and 5 at the other side of the machine.

Cleaning the Brake Drum and Shoes

At both sides of the machine, clean inside the brake drums, the brake shoes, backing plate (Figure 80), and when installed, clean the optional grass shield of any grass, dirt, and dust.

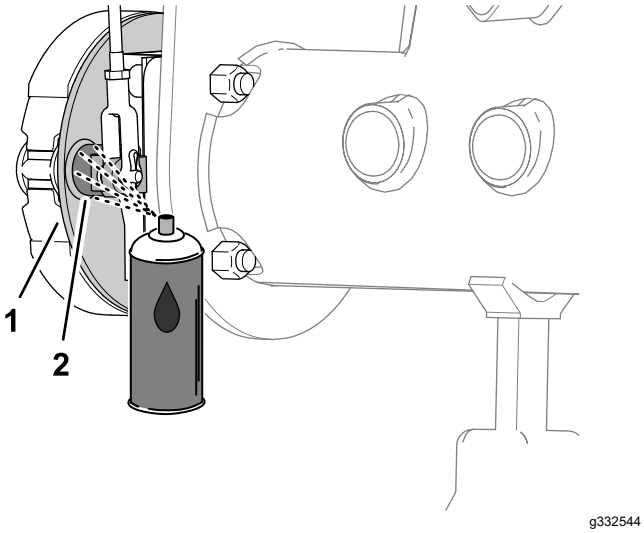


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Figure 80

Inspecting and Lubricating the Brake Cam Shaft

1. At the inboard side of the brake-backing plate (machines without the optional wheel-rim grass shield) or the wheel shield (machines with the optional wheel-rim grass shield), spray penetrating oil between the brake cam shaft and the backing plate (Figure 81 or Figure 82).

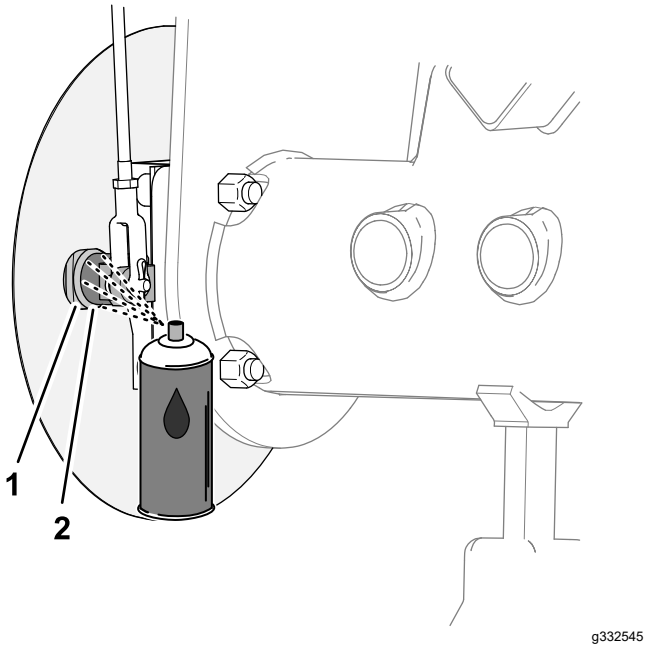


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Figure 81

Machines without the Optional Grass Shield

1. Backing plate
2. Brake cam shaft



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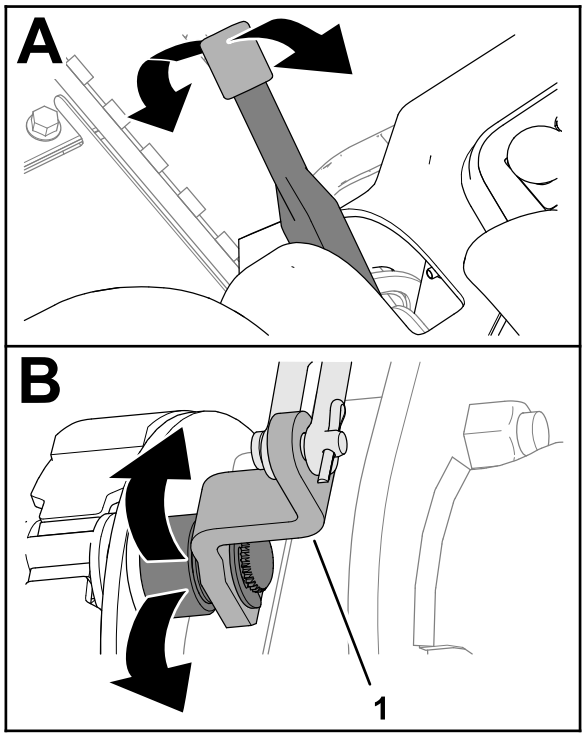
Figure 82

Machines with the Optional Grass Shield

1. Backing plate
2. Brake cam shaft

2. Move the parking brake lever up and down to check that the lever for the brake-cam lever moves freely (Figure 83).

   Note: If the brake cam binds, repair or replace the brake cam; refer to the *Service Manual* for your machine.



g332560

Figure 83

1. Brake-cam lever

3. Repeat steps 1 and 2 at the other side of the machine.
4. Move the parking brake lever down (the disengaged position).

Inspecting the Brake Linkage

1. Inspect the left and right brake-rod assemblies (Figure 84) for damage and wear.

   Note: If the brake rod parts are damaged and worn, replace them; refer to the *Service Manual* for your machine.

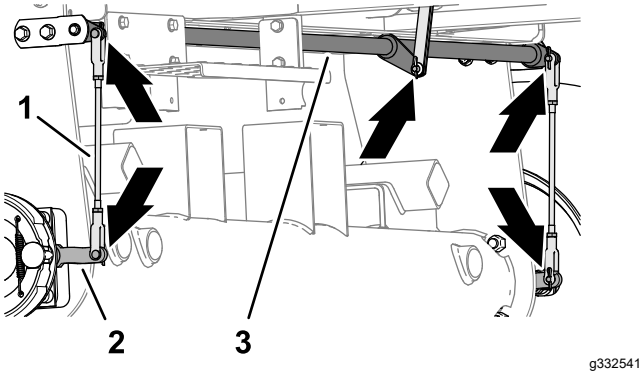


Figure 84

1. Brake-rod assemblies
2. Brake-cam lever
3. Brake pivot shaft

2. Inspect the brake pivot shaft (Figure 84) for damage and wear.

   If the pivot shaft is damaged and worn, replace them; refer to the *Service Manual* for your machine.

Installing the Wheel Hub and Brake Drum

1. Thoroughly clean the wheel hub and hydraulic motor shaft.
2. Insert the woodruff key into the groove of the wheel-motor shaft (Figure 85).

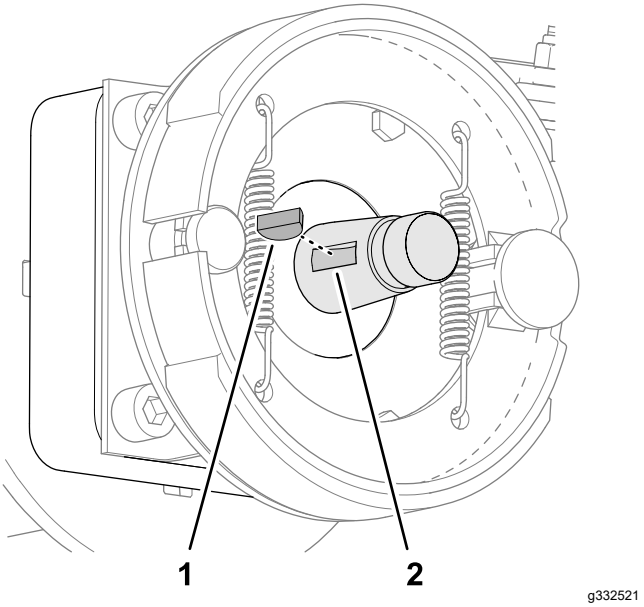


Figure 85

1. Woodruff key
2. Groove (wheel-motor shaft)

3. Assemble the wheel hub and brake drum onto the wheel-motor shaft (Figure 86 or Figure 87).

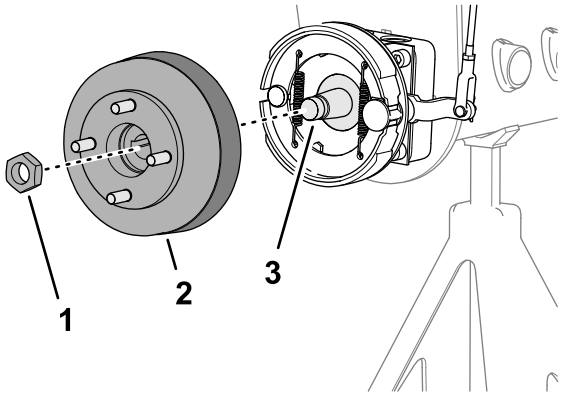


Figure 86

Machines without the Optional Grass Shield

1. Locknut
2. Hub and brake drum
3. Wheel-motor shaft

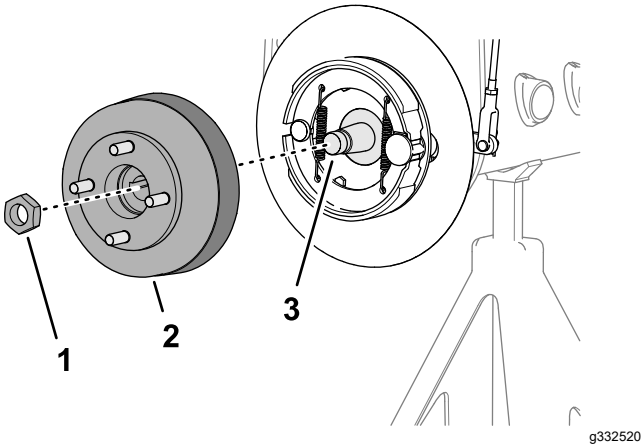


Figure 87

Machines with the Optional Grass Shield

1. Locknut
2. Hub and brake drum
3. Wheel-motor shaft

4. Secure the wheel hub to the shaft with the locknut (Figure 86 or Figure 87), and tighten by hand.

   Note: The brake shoes and backing plate must concentrically align with the brake drum. If the shoes, plate, and drum are misaligned, refer to the *Service Manual* for your machine.

5. Repeat steps 1 through 4 at the other side of the machine.

Installing the Wheel

1. Assemble the wheel to the hub with the 4 lug nuts (Figure 88), and tighten the lug nuts by hand.

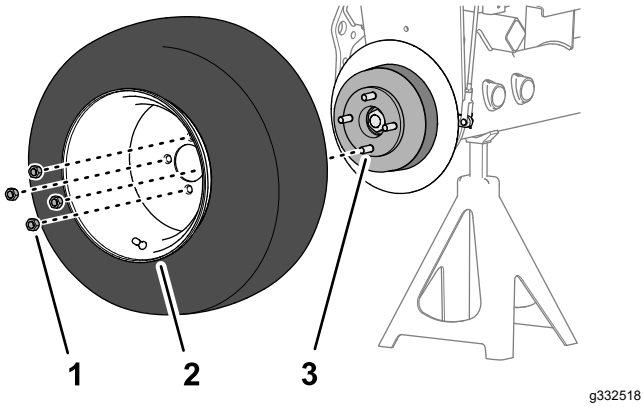


Figure 88

1. Lug nut
2. Wheel
3. Hub

2. Repeat step 1 at the other side of the machine.
3. Remove the jack stands and lower the machine.
4. Torque wheel lug nuts to 95 to 122·Nm (70 to 90 ft-lb) in a crossing pattern.
5. Torque the locknut is to 339 to 372 N·m (250 to 275 ft-lb).
6. Check parking brake and adjust it if necessary; refer to Servicing the Parking Brakes (page 54).

Belt Maintenance

Servicing the Engine Belts

Service Interval: After the first 10 hours—Check the condition and tension of all belts.

Every 100 hours—Check the condition and tension of all belts.

Tensioning the Alternator/Fan Belt

1. Prepare the machine for maintenance; refer to Preparing for Maintenance (page 42).
2. Unlatch and open the hood.
3. Check the belt tension by pressing the belt midway between the alternator and crankshaft pulleys.

   Note: With 98 N (22 lb) of force, the belt should deflect 11 mm (7/16 inch).

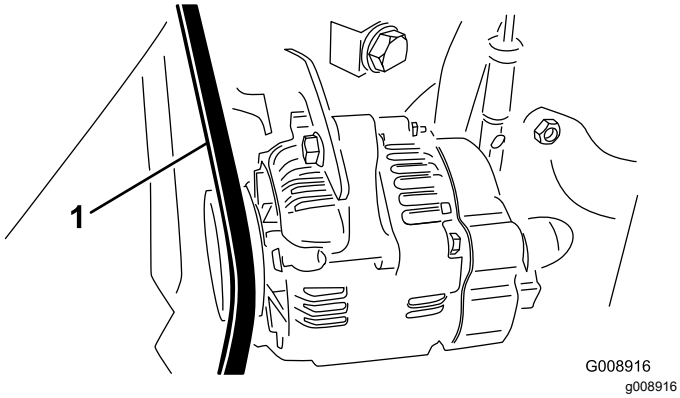


Figure 89

1. Alternator/fan belt

4. If the deflection is incorrect, complete the following procedure to tension the belt:
   A. Loosen the bolt securing the brace to the engine and the bolt securing the alternator to the brace.
   B. Insert a pry bar between the alternator and engine and pry the alternator outward.
   C. When you achieve proper belt tension, tighten the alternator and brace bolts to secure the adjustment.
5. Close and latch the hood.

Replacing the Hydrostat Drive Belt

1. Insert a nut driver or small piece of tubing onto the end of the belt tensioning spring.

⚠ WARNING

When you replace the hydrostat drive belt, you must release the tension on the spring, which is under a heavy load. Releasing the tension on the spring improperly may result in serious personal injury.

Be careful when releasing the tension on the spring.

2. Push down the end of the belt-tension spring down and out of the notch in the tab of the pump mount, and move the spring end forward (Figure 90).

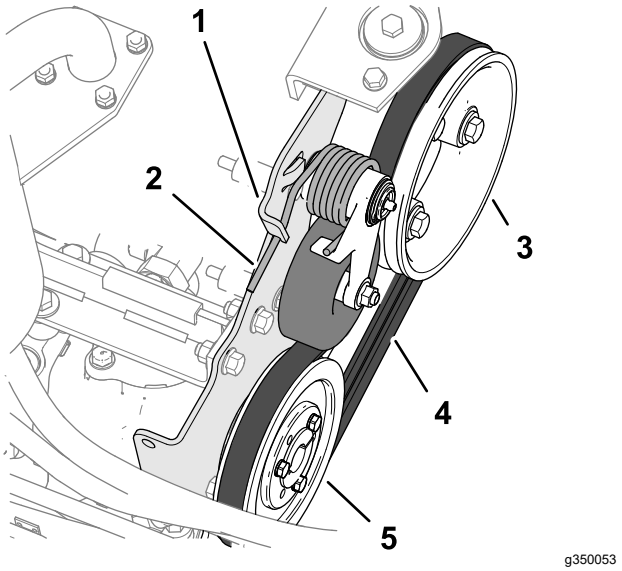


Figure 90

1. Pump mount tab
2. Belt-tension spring
3. Engine pulley
4. Drive belt
5. Hydrostat pulley

3. Replace the belt.
4. Push down the end of the belt-tension spring, and inward, and align it into the notch in the pump mount tab.

Adjusting Mow Ground Speed

1. Prepare the machine for maintenance; refer to Preparing for Maintenance (page 42).
2. Loosen the jam nut for the speed stop screw.
3. Adjust the speed stop screw as follow:

   Note: The mow speed is set at the factory to 9.7 km/h (6 mph).

   - To decrease the mow speed, rotate the speed stop screw (Figure 91) clockwise.
   - To increase the mow speed, rotate the speed stop screw counterclockwise.

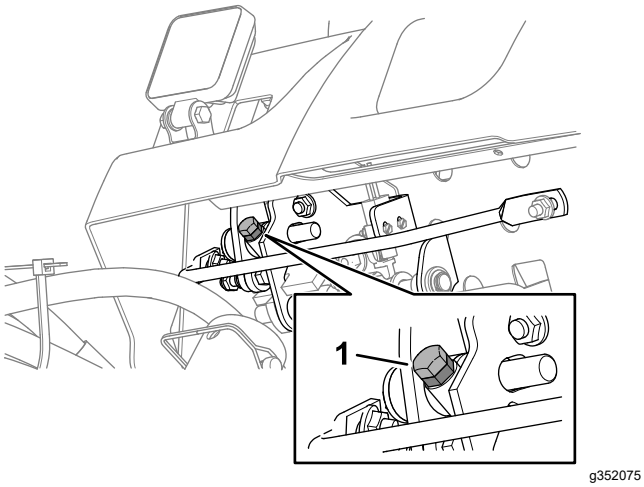


Figure 91

1. Speed stop screw

4. Hold the stop screw and tighten the jam nut.
5. Test drive the machine to confirm the maximum mow speed adjustment.

Adjusting the Throttle

1. Prepare the machine for maintenance; refer to Preparing for Maintenance (page 42).
2. Unlatch and open the hood.
3. Position the throttle lever rearward so that it stops against the control panel slot.
4. Loosen the throttle cable connector on the injection pump lever arm (Figure 92).

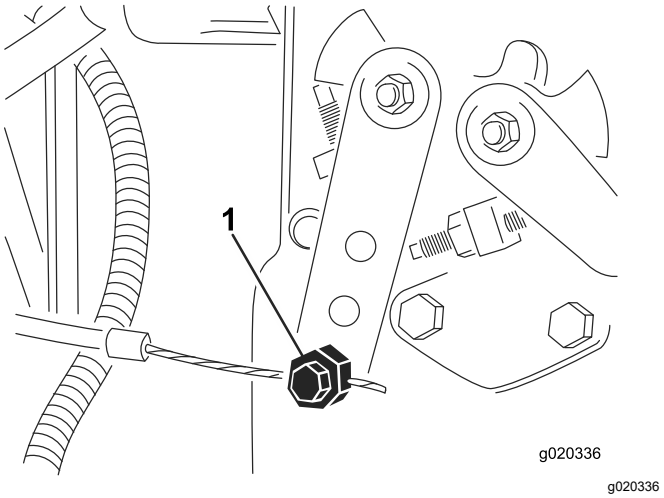


Figure 92

1. Injection pump lever arm

5. Hold the injection pump lever arm against the low idle stop and tighten the cable connector.
6. Loosen the screws securing the throttle control to the control panel.
7. Push the throttle control lever all the way forward.
8. Slide the stop plate until it contacts the throttle lever and tighten the screws securing the throttle control to the control panel.
9. If the throttle does not stay in position during operation, torque the locknut, used to set the friction device on the throttle lever, to 5 to 6 N·m (44 to 53 in-lb).

   Note: The maximum force required to operate the throttle lever should be 89 N (20 lb).
10. Close and latch the hood.

Hydraulic System Maintenance

Hydraulic System Safety

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

Checking the Hydraulic Lines and Hoses

Service Interval: Before each use or daily

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

Hydraulic Fluid Specifications

The reservoir is filled at the factory with high-quality hydraulic fluid. Check the level of the hydraulic fluid before you first start the engine and daily thereafter; refer to Checking the Hydraulic Fluid (page 61).

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

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

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

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

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

Material Properties:

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

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

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

Checking the Hydraulic Fluid

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

The reservoir is filled at the factory with high-quality hydraulic fluid. The best time to check the hydraulic oil is when the fluid is cold. The machine should be in its transport configuration.

1. Prepare the machine for maintenance; refer to Preparing for Maintenance (page 42).
2. Clean the area around the filler neck and cap of the hydraulic-fluid tank (Figure 93) and remove the cap.

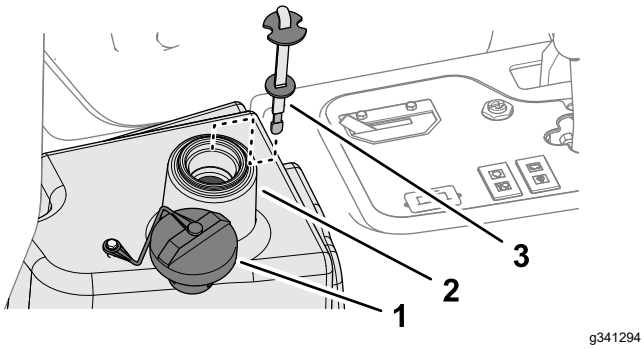


Figure 93

1. Cap
2. Filler neck (hydraulic-fluid reservoir)
3. Dipstick

3. Remove the 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 the fluid level.

   Note: The fluid level should be within 6 mm (1/4 inch) of the mark on the dipstick.
5. If the level is low, add the specified fluid to raise the level to the full mark; refer to Hydraulic Fluid Specifications (page 61).

   Important: **Do not overfill the hydraulic reservoir.**
6. Install the dipstick and cap onto the filler neck.

Hydraulic Fluid Capacity

22.7 L (6 US gallons); refer to Hydraulic Fluid Specifications (page 61)

Changing the Hydraulic Fluid

Service Interval: Every 2,000 hours—**If you are using the recommended hydraulic fluid,** change the hydraulic fluid.

Every 800 hours—**If you are not using the recommended hydraulic fluid or have ever filled the reservoir with an alternative fluid,** change the hydraulic fluid.

⚠ WARNING

Hot hydraulic fluid can cause severe burns.

Allow the hydraulic fluid to cool before performing any maintenance to the hydraulic system.

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

1. Prepare the machine for maintenance; refer to Preparing for Maintenance (page 42).
2. Disconnect the large hydraulic hose (Figure 94) from the reservoir, and let the hydraulic fluid flow into a drain pan.

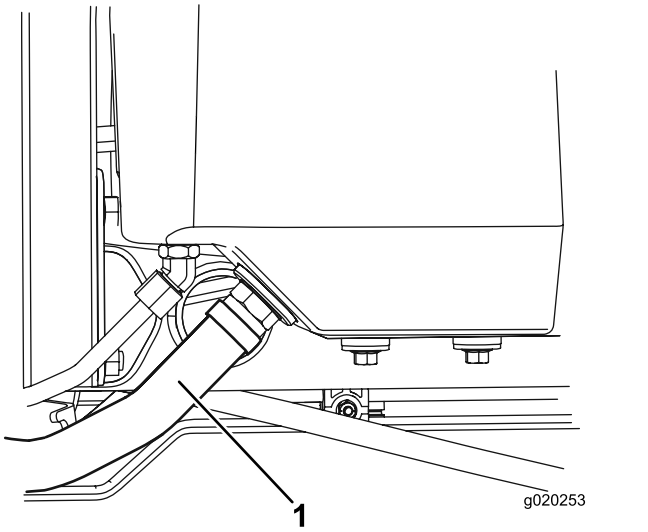


Figure 94

1. Hydraulic hose

3. Install the hydraulic hose when hydraulic fluid stops draining.
4. Fill the reservoir (Figure 95) with approximately 22.7 L (6 US gallons) of hydraulic fluid; refer to Hydraulic Fluid Specifications (page 61).

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

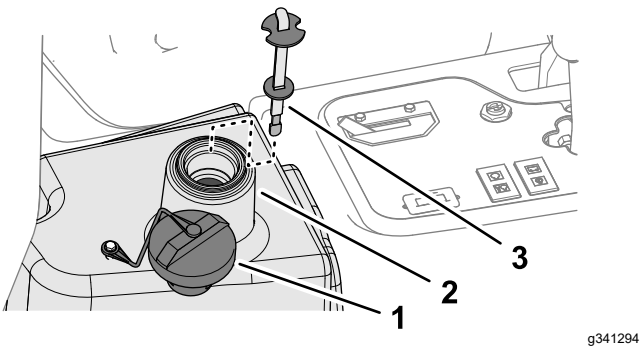


Figure 95

1. Cap
2. Filler neck (hydraulic-fluid reservoir)
3. Dipstick

5. Install the dipstick and cap onto the filler neck.

6. Start the engine and use all the hydraulic controls to distribute the hydraulic fluid throughout the system.
7. Check for leaks; then shut off the engine.
8. Check the fluid level and add enough to raise the level to Full mark on the dipstick.

   Important: **Do not overfill the reservoir.**

Changing the Hydraulic Filter

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

Every 800 hours—**If you are not using the recommended hydraulic fluid or have ever filled the reservoir with an alternative fluid,** replace the hydraulic filter.

⚠ WARNING

Hot hydraulic fluid can cause severe burns.

Allow the hydraulic fluid to cool before performing any maintenance to the hydraulic system.

Use a genuine Toro replacement filter (Part No. 86-3010).

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

1. Prepare the machine for maintenance; refer to Preparing for Maintenance (page 42).
2. Clean around the filter mounting area. Place a drain pan under the filter (Figure 96) and remove the filter.

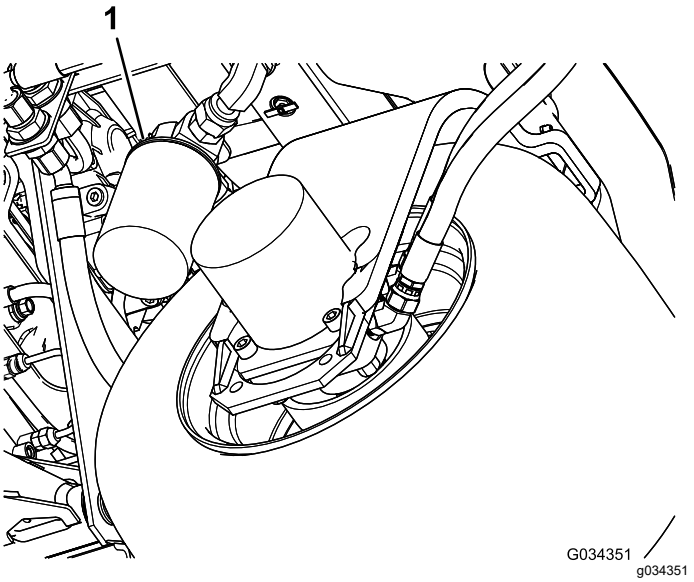


Figure 96

1. Hydraulic filter
2. Filter head

3. Lubricate the new filter gasket and fill the filter with hydraulic fluid.
4. Ensure that the filter mounting area is clean. Screw the filter on until the gasket contacts the mounting plate; then tighten the filter 1/2 turn.
5. Start the engine and let it run for about 2 minutes to purge air from the system. Shut off the engine and check for leaks.

Cutting Unit System Maintenance

Blade Safety

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

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

Checking the Reel-to-Bedknife Contact

Service Interval: Before each use or daily

Check the reel-to-bedknife contact even if the quality of cut had been acceptable previously. There must be light contact across the full length of the reel and bedknife; refer to Adjusting Reel to Bedknife in the cutting unit *Operator's Manual*.

Using the Optional Gauge Bar

Use the gauge bar (Figure 97) to adjust the cutting unit. Refer to the cutting unit *Operator's Manual* for the adjustment procedure.

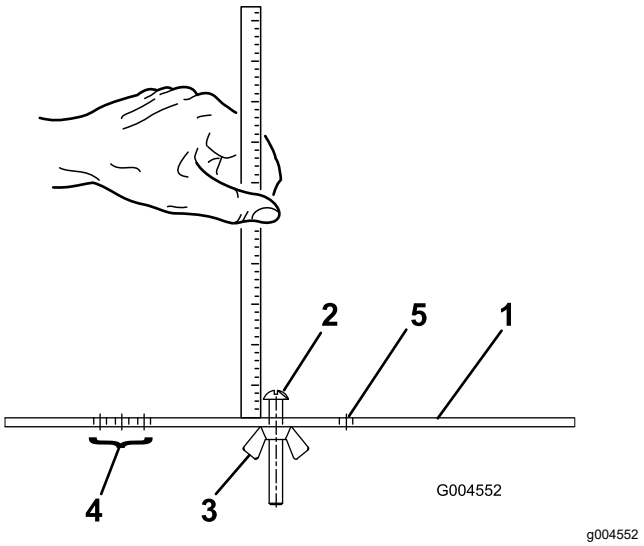


Figure 97

1. Gauge bar
2. Height adjusting screw
3. Nut
4. Holes used for setting groomer HOG
5. Hole not used

Backlapping the Cutting Units

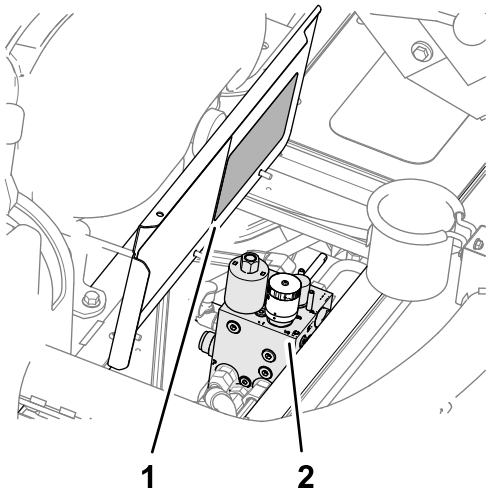
⚠ WARNING

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

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

Preparing the Machine

1. Prepare the machine for maintenance; refer to Preparing for Maintenance (page 42).
2. Make the initial reel-to-bedknife adjustments appropriate for backlapping; refer to the cutting unit *Operator's Manual*.
3. Raise the platform cover (Figure 71) to expose the mower manifold.

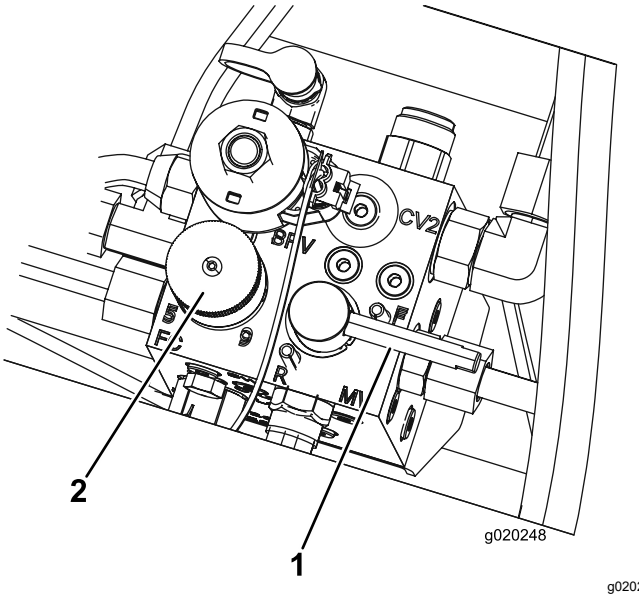


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Figure 98

1. Reel speed chart decal (platform cover)
2. Mower manifold

4. Record of the speed number at which the reel speed control knob is set.



g020248

Figure 99

1. Backlap lever
2. Reel speed control knob

5. Set the reel speed control knob to position 1 (Figure 99).
6. Move the backlap lever to the R (backlap) position (Figure 99).

   Note: The machine is in the backlap mode when the mow/transport slide to the right (MOW) position and the backlap lever in the R (backlap) position.

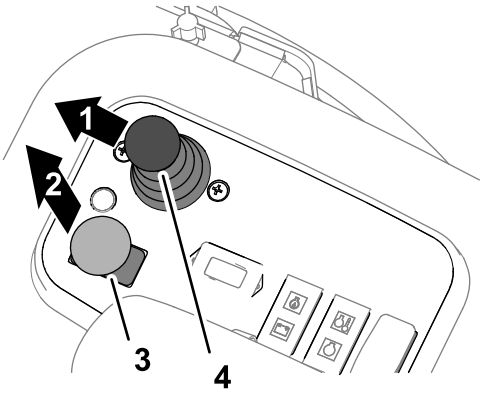
Lapping the Reels and Bedknife

⚠ DANGER

Changing the engine speed while backlapping may cause the cutting units to stall.

- **Never change the engine speed while backlapping reels and bedknives.**
- **Backlap only at idle engine speed.**

1. Start the engine and allow it to run at low idle speed.
2. Press the cutting unit drive switch to the ENGAGE position.



g352634

Figure 100

1. Lower
2. Engage
3. Cutting unit drive switch
4. Lower mow/raise control

3. Move the lower mow/raise control lever forward (Figure 100).

   Note: The reels of all cutting units rotate backward.
4. Apply lapping compound to the reel with a long-handle brush.

⚠ DANGER

Contacting the cutting units when they are moving could cause personal injury.

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

Important: **Never use a short-handled brush.**

5. If the cutting units stall or become erratic while backlapping, adjust the reel speed control knob until the reel speed stabilizes, then return the reel speed to setting 1 or to your desired speed.
6. If you need to make an adjustment to the cutting units while backlapping, perform the following steps:

A. Move the lower mow/raise control lever rearward.

   Note: The cutting units shut off, but do not raise.

B. Press the cutting unit drive switch to the DISENGAGE position.

C. Shut off the engine and remove the key.

D. Adjust to the cutting units.

E. Repeat steps 1 through 5.

7. Repeat steps 4 for the other cutting units that you want to backlap.

Finishing Backlapping

1. Press the cutting unit control switch to the DISENGAGE position.
2. Shut off the engine.
3. Move the backlap lever to the F (mow) position (Figure 101).

   Important: **If you do not change backlap lever to the F (mow) position after backlapping, the cutting units will not raise or function properly.**

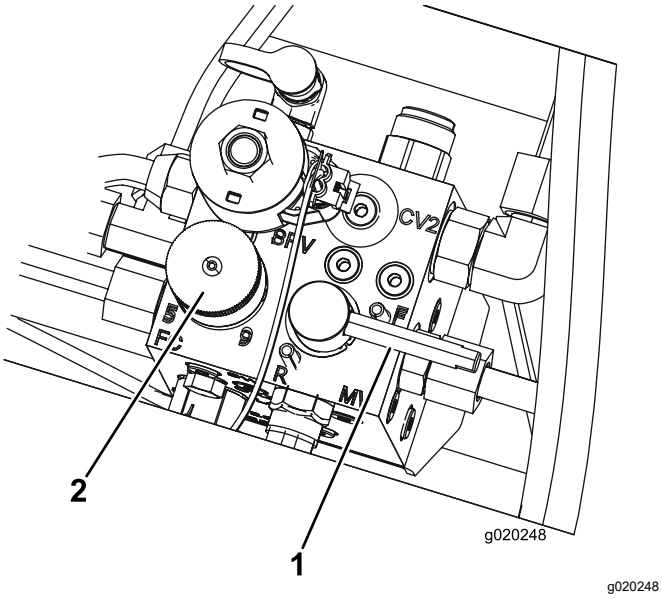


Figure 101

1. Backlap lever
2. Reel speed control knob

4. Adjust the cutting unit reel speed control to setting that you noted in step 4 of Preparing the Machine (page 64).
5. Close the floor panel.
6. Wash all lapping compound off from the cutting units.
7. For a better cutting edge, run a file across the front face of the bedknife after lapping.

Note: This removes any burrs or rough edges that may have built up on the cutting edge.

Cleaning

Washing the Machine

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

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

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

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

Storage

Storage Safety

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

Preparing the Traction Unit

1. Park the machine on a level surface, lower the cutting units, engage the parking brake, shut off the engine, and remove the key.
2. Thoroughly clean the traction unit, cutting units, and the engine.
3. Check the tire pressure; refer to 3 Adjusting Tire Air Pressure (page 17).
4. Check all fasteners for looseness; tighten them as necessary.
5. Grease or oil all grease fittings and pivot points. Wipe up any excess lubricant.
6. Lightly sand and use touch-up paint on painted areas that are scratched, chipped, or rusted. Repair any dents in the metal body.
7. Service the battery and cables as follows; refer to Servicing the Battery (page 49):
   A. Remove the battery terminals from the battery posts.
   B. Clean the battery, terminals, and posts with a wire brush and baking-soda solution.
   C. Coat the cable terminals and battery posts with Grafo 112X skin-over grease (Toro Part No. 505-47) or petroleum jelly to prevent corrosion.
   D. Slowly charge the battery 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 install the drain plug.
2. Remove and discard the oil filter. Install a new oil filter.
3. Fill the engine with specified motor oil.
4. Start the engine and run it at idle speed for approximately 2 minutes.
5. Shut off the engine and remove the key.
6. Flush the fuel tank with fresh, clean fuel.
7. Secure all the fuel-system fittings.
8. Thoroughly clean and service the air-cleaner assembly.
9. Seal the air-cleaner inlet and the exhaust outlet with weatherproof tape.
10. Check the antifreeze protection and add a 50/50 solution of water and ethylene glycol antifreeze as needed for the expected minimum temperature in your area.

Storing the Battery

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

Troubleshooting

Understanding the Diagnostic ACE Display

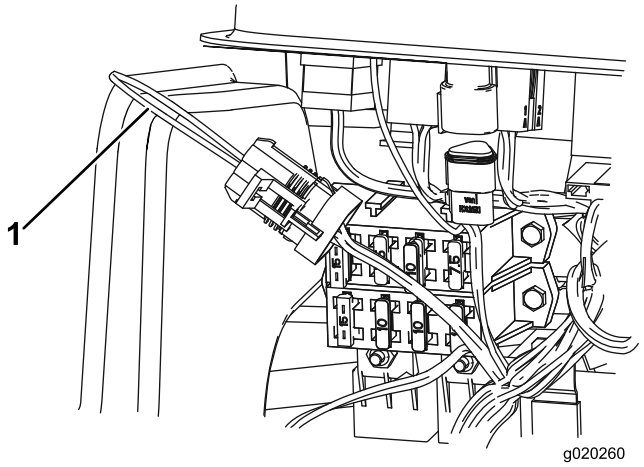
The machine is equipped with an electronic controller that controls most machine functions. The controller determines what function is required for various input switches (i.e., seat switch, key switch, etc.) and turns on the outputs to actuate solenoids or relays for the requested machine function.

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

Use the Diagnostic ACE display to help verify and correct electrical functions of the machine.

Verifying the Interlock Switch Function

1. Park the machine on a level surface, lower the cutting units, engage the parking brake, and shut off the engine.
2. Remove the cover from the control panel.
3. Locate the wire harness and loop-back connector (Figure 102).



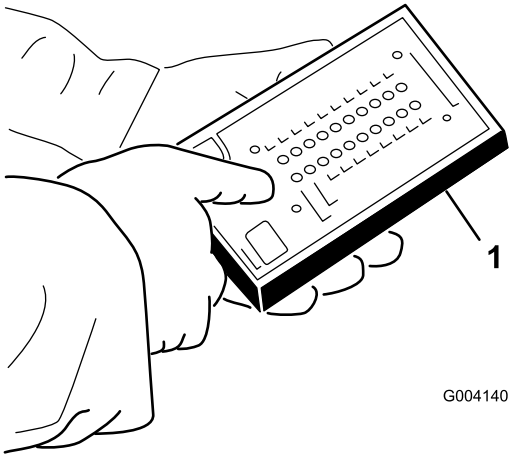
g020260

Figure 102

1. Loop-back connector

4. Carefully unplug the loop-back connector from the harness connector.
5. Connect the Diagnostic ACE display connector to the harness connector (Figure 103).

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



g004140

Figure 103

1. Diagnostic ACE

6. Turn the key switch to the On position, but do not start the machine.

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

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

   The Diagnostic ACE illuminates the LED associated with each of the inputs when that input switch is closed.

8. Individually, change each of the switches from open to closed (i.e., sit on the seat, engage the traction pedal, etc.), and note that the appropriate LED on the Diagnostic ACE blinks on and off when the corresponding switch is closed. Repeat this for all switches that you can change by hand.

9. If a switch is closed and the appropriate LED does not turn on, check all wiring and connections to the switch and/or check the switches with an ohm meter or multimeter. Replace any malfunctioning switches and repair any malfunctioning wiring.

   Note: The Diagnostic ACE is also able 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, engage the parking brake, shut off the engine, and remove the key.
2. Remove the access panel from the side of the control arm.
3. Locate the wire harness and connectors near the controller.
4. Carefully unplug the loop-back connector from the harness connector.
5. Connect the Diagnostic ACE connector to the harness connector.

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

6. Turn the key switch to the On position, but do not start the machine.

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

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

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

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

   Note: If the correct output LEDs do not illuminate, verify that the required input switches are in the necessary positions to allow that function to occur. Verify correct switch function. If the output LEDs are on as specified, but the machine does not function properly, this indicates a non-electrical problem. Repair as necessary.

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

   Important: **The Diagnostic ACE display must not be left connected to the machine. It is not designed to withstand the environment of the everyday use of the machine. When you are finished using the Diagnostic ACE, disconnect it from the machine and connect the loop-back connector to the harness connector. The machine does not operate without the loop-back connector installed on the harness. Store the Diagnostic ACE in a dry, secure location in the shop, not on the machine.**

Notes:

Notes:

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

Two-Year or 1,500 Hours Limited Warranty

Conditions and Products Covered

The Toro Company warrants your Toro Commercial product (“Product”) to be free from defects in materials or workmanship for 2 years or 1,500 operational hours*, whichever occurs first. This warranty is applicable to all products with the exception of Aerators (refer to separate warranty statements for these products). Where a warrantable condition exists, we will repair the Product at no cost to you including diagnostics, labor, parts, and transportation. This warranty begins on the date the Product is delivered to the original retail purchaser.
* Product equipped with an hour meter.

Instructions for Obtaining Warranty Service

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

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

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

Owner Responsibilities

As the product owner, you are responsible for required maintenance and adjustments stated in your *Operator's Manual*. Repairs for product issues caused by failure to perform required maintenance and adjustments are not covered under this warranty.

Items and Conditions Not Covered

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

- Product failures which result from the use of non-Toro replacement parts, or from installation and use of add-on, or modified non-Toro branded accessories and products.
- Product failures which result from failure to perform recommended maintenance and/or adjustments.
- Product failures which result from operating the Product in an abusive, negligent, or reckless manner.
- Parts consumed through use that are not defective. Examples of parts which are consumed, or used up, during normal Product operation include, but are not limited to, brake pads and linings, clutch linings, blades, reels, rollers and bearings (sealed or greasable), bed knives, spark plugs, castor wheels and bearings, tires, filters, belts, and certain sprayer components such as diaphragms, nozzles, flow meters, and check valves.
- Failures caused by outside influence, including, but not limited to, weather, storage practices, contamination, use of unapproved fuels, coolants, lubricants, additives, fertilizers, water, or chemicals.
- Failure or performance issues due to the use of fuels (e.g. gasoline, diesel, or biodiesel) that do not conform to their respective industry standards.
- Normal noise, vibration, wear and tear, and deterioration. Normal “wear and tear” includes, but is not limited to, damage to seats due to wear or abrasion, worn painted surfaces, scratched decals or windows.

Parts

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

Deep Cycle and Lithium-Ion Battery Warranty

Deep cycle and Lithium-Ion batteries have a specified total number of kilowatt-hours they can deliver during their lifetime. Operating, recharging, and maintenance techniques can extend or reduce total battery life. As the batteries in this product are consumed, the amount of useful work between charging intervals will slowly decrease until the battery is completely worn out. Replacement of worn out batteries, due to normal consumption, is the responsibility of the product owner.
Note: (Lithium-Ion battery only): Refer to the battery warranty for additional information.

Lifetime Crankshaft Warranty (ProStripe 02657 Model Only)

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

Maintenance is at Owner’s Expense

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

General Conditions

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

The Toro Company is not liable for indirect, incidental or consequential damages in connection with the use of the Toro Products covered by this warranty, including any cost or expense of providing substitute equipment or service during reasonable periods of malfunction or non-use pending completion of repairs under this warranty. Except for the Emissions warranty referenced below, if applicable, there is no other express warranty. All implied warranties of merchantability and fitness for use are limited to the duration of this express warranty.

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

Note Regarding Emissions Warranty

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

Countries Other than the United States or Canada

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



Count on it.