



Count on it.

Operator's Manual

**Commercial Walk-Behind Mower
Floating Deck, Split Lever, Hydro Drive with
48in and 52in TURBO FORCE® Cutting Unit**

Model No. 30488—Serial No. 315000001 and Up

Model No. 30489—Serial No. 315000001 and Up



WARNING

CALIFORNIA Proposition 65 Warning

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

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

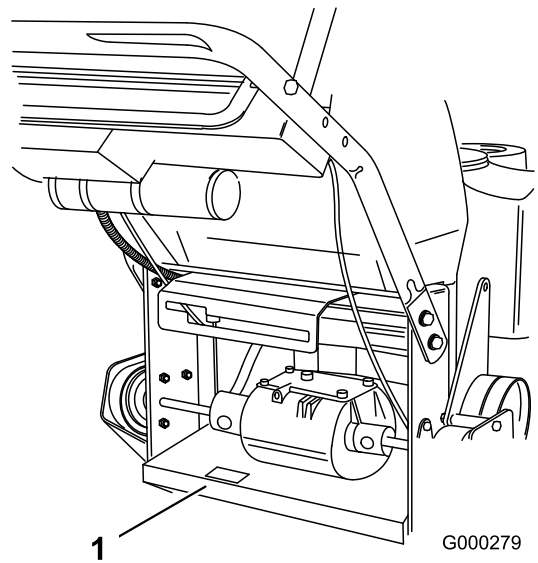


Figure 1

1. Model and serial number location

Model No. _____
Serial No. _____

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



Figure 2

1. Safety alert symbol

This manual uses 2 words to highlight information.

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

Introduction

This rotary-blade, lawn mower is intended to be used by professional, hired operators or residential homeowners. It is designed primarily for cutting grass on well-maintained lawns on residential or commercial properties. It is not designed for cutting brush or for agricultural uses.

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

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

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

Contents

Safety	4	Adjusting the PTO-drive Belt Idler-Spring Anchor.....	40
Safe Operating Practices.....	4	Replacing the Pump-Drive Belt	40
Toro Mower Safety	5	Controls System Maintenance	41
Slope Indicator	7	Adjusting the Motion-Control Handle.....	41
Safety and Instructional Decals	8	Hydraulic System Maintenance	43
Product Overview	13	Servicing the Hydraulic System.....	43
Controls	13	Mower Deck Maintenance.....	45
Specifications	14	Servicing the Cutting Blades.....	45
Operation	15	Correcting the Mower Quality of Cut	47
Adding Fuel.....	15	Setting up the Frame.....	48
Checking the Engine-Oil Level.....	16	Checking the Mower Deck Front-to-Rear Pitch	49
Putting Safety First	16	Changing the Mower Deck Front-to-Rear Pitch	50
Operating the Parking Brake	16	Checking the Mower Deck Side-to-Side Height.....	50
Starting and Stopping the Engine.....	16	Changing the Mower Deck Side-to-Side Height.....	51
Operating the Mower-Blade Control (PTO)	17	Matching the Height of Cut.....	51
Using the Safety-Interlock System.....	18	Replacing the Grass Deflector.....	51
Driving Forward or Backward	18	Cleaning	52
Stopping the Machine	19	Cleaning under the Mower	52
Pushing the Machine by Hand	19	Disposing of Waste.....	52
Transporting the Machine.....	20	Storage	52
Side Discharging or Mulching the Grass.....	20	Cleaning and Storing the Machine	52
Adjusting the Height-of-Cut	20	Troubleshooting	54
Adjusting the Anti-Scalp Rollers	21	Schematics	56
Adjusting the Flow Baffle	22		
Positioning the Flow Baffle.....	22		
Using the Mid-Size Weight.....	23		
Maintenance	24		
Recommended Maintenance Schedule(s)	24		
Lubrication	25		
Lubricating the Bearings.....	25		
Greasing the PTO Drive-Belt Idler and the Mower-Deck-Belt Idler.....	25		
Engine Maintenance	26		
Servicing the Air Cleaner	26		
Servicing the Engine Oil.....	26		
Servicing the Spark Plugs.....	28		
Fuel System Maintenance	29		
Draining the Fuel Tank	29		
Servicing the Fuel Filter.....	29		
Servicing the Fuel-Vent System	30		
Electrical System Maintenance	31		
Servicing the Battery.....	31		
Servicing the Fuses.....	33		
Drive System Maintenance	34		
Adjusting the Tracking	34		
Checking the Tire Pressure	34		
Replacing the Caster-Wheel-Fork Bushings	34		
Servicing the Caster Wheel and Bearings	35		
Adjusting the Electric Clutch.....	36		
Cooling System Maintenance	36		
Cleaning the Air-Intake Screen	36		
Brake Maintenance	37		
Servicing the Brake.....	37		
Belt Maintenance	38		
Replacing the Mower Belt.....	38		
Replacing the PTO-Drive Belt.....	39		

Safety

Improper use or maintenance by the operator or owner can result in injury. To reduce the potential for injury, comply with these safety instructions, and pay attention to the safety alert symbol, which means **Caution, Warning, or Danger**—“personal safety instruction.” **Failure to comply with the instructions may result in personal injury or death.**

Important: This machine was manufactured according to the appropriate regulatory standards in effect at the time of manufacture. Modifying this machine in any way may cause it to be out of compliance with those standards and with the instructions in this Operator’s Manual. Modifications to this machine should only be made by either the manufacturer or an Authorized Toro Dealer.

This product is capable of amputating hands and feet. Follow all safety instructions to avoid serious injury or death.

The owner/user can prevent and is responsible for accidents or injuries occurring to people, or damage to property.

Important: The addition of attachments made by other manufacturers that do not meet American National Standards Institute certification will cause noncompliance of this machine.

Safe Operating Practices

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

Training

- Read the *Operator’s Manual* and other training material.
Note: If the operator(s) or mechanic(s) cannot read the manual language, it is the owner’s responsibility to explain this material to them.
- Become familiar with the safe operation of the equipment, operator controls, and safety signs.
- All operators and mechanics should be trained. The owner is responsible for training the users.
- Never let children or untrained people operate or service the equipment. Local regulations may restrict the age of the operator.
- The owner/user can prevent and is responsible for accidents or injuries occurring to people, or damage to property.

Preparation

- Evaluate the terrain to determine what accessories and attachments are needed to properly and safely perform the job.
Note: Only use accessories and attachments approved by the manufacturer.
- Wear appropriate clothing including: a hard hat, safety glasses, and hearing protection. Long hair, loose clothing or jewelry may get tangled in moving parts.
- Inspect the area where the equipment is used, and remove all objects that can be thrown by the machine.
- Check that operator’s presence controls, safety switches and shields are attached and functioning properly. Do not operate unless they are functioning properly.

Operation

- Lightning can cause severe injury or death. If lightning is seen, or thunder is heard in the area, do not operate the machine; seek shelter.
- Do not run an engine in an enclosed area.
- Only operate in well-lit areas, keeping away from holes and hidden hazards.
- Ensure that all drives are in neutral and that the parking brake is engaged before starting engine. Only start the engine from the operator’s position.
- Make sure that you have good footing while using this machine, especially when backing up.
Note: Reduced footing could cause slipping.
- Slow down and use extra care on hillsides. Be sure to travel side to side on hillsides. Turf conditions can affect the stability of the machine. Use caution while operating near drop-offs.
- Slow down and use caution when making turns and when changing directions on slopes.
- Do not raise the mower deck with the blades running.
- Do not operate the machine without the PTO shield or other guards securely in place. Be sure all interlocks are attached, adjusted properly, and functioning properly.
- Do not operate with the discharge deflector raised, removed or altered, unless using a grass catcher.
- Do not change the engine governor setting or overspeed the engine.
- Stop on level ground, disengage drives, engage the parking brake (if provided), shut off the engine before leaving the operator’s position for any reason, including emptying the catchers or unclogging the chute.
- Stop equipment and inspect the blades after striking objects or if an abnormal vibration occurs. Make the necessary repairs before resuming operations.
- Keep your hands and feet away from the cutting unit.
- Look behind and down before backing up to ensure a clear path.

- Keep pets and bystanders away from an operating machine.
- Slow down and use caution when making turns and crossing roads and sidewalks. Stop the blades if you are not mowing.
- Be aware of the mower-discharge direction and do not point it at anyone.
- Do not operate the mower under the influence of alcohol or drugs.
- Use care when loading or unloading the machine into or from a trailer or truck.
- Use care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.

Safe Handling of Fuels

- To avoid personal injury or property damage, use extreme care in handling gasoline. Gasoline is extremely flammable and the vapors are explosive.
- Extinguish all cigarettes, cigars, pipes, and other sources of ignition.
- Use only an approved fuel container.
- Do not remove the fuel cap or add fuel with the engine running.
- Allow the engine to cool before fueling.
- Do not refuel the machine indoors.
- 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.
- Do not fill containers inside a vehicle, on a truck, or on a trailer bed with a plastic liner. Always place containers on the ground away from your vehicle before filling.
- Remove equipment from the truck or trailer and fuel it on the ground. If this is not possible, then add fuel with such equipment as a portable container, rather than from a fuel dispenser nozzle.
- Keep the nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete.
- Do not use a nozzle lock open device.
- If fuel is spilled on clothing, change your clothing immediately.
- Do not overfill fuel tank. Replace fuel cap and tighten securely.

Maintenance and Storage

- Disengage drives, set the parking brake, stop the engine, and remove the key or disconnect spark-plug wire. Wait for all movement to stop before adjusting, cleaning, or repairing.
- Park the machine on a level surface.
- Clean grass and debris from the cutting unit, drives, mufflers, and engine to help prevent fires.
- Clean up oil or fuel spillage.
- Let the engine cool before storing.
- Do not store fuel near flames or drain indoors.
- Do not allow untrained personnel to service machine.
- Use jack stands to support components when required.
- Carefully release pressure from components with stored energy.
- Disconnect the battery or remove the spark-plug wire before making any repairs. Disconnect the negative terminal first and the positive terminal last. Reconnect the positive first and negative last.
- Use care when checking the blades. Wrap the blade(s) or wear gloves, and use caution when servicing them. Only replace blades; do not straighten or weld them.
- Keep hands and feet away from moving parts. If possible, do not make adjustments with the engine running.
- Keep all parts in good working condition and all hardware tightened. Replace all worn or damaged decals.

Hauling

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

Toro Mower Safety

The following list contains safety information specific to Toro products and other safety information you must know.

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

This product is designed for cutting and recycling grass, or, when equipped with a grass bagger, for catching cut grass. Any use for purposes other than these could prove dangerous to the user and bystanders.

General Operation

- Be sure that the area is clear of bystanders before mowing. Stop the machine if anyone enters the area.
- Do not touch equipment or attachment parts which may be hot from operation. Allow all of the parts to cool before attempting to maintain, adjust, or service the machine.
- Use only Toro-approved attachments. Warranty may be voided if used with any unapproved attachments.
- Check carefully for overhead clearances (i.e. branches, doorways, electrical wires, etc.) before operating under any objects, and do not contact them.
- Slow down before making turns and use extra caution.
- Use caution when riding the platform over curbs, rocks, roots, or other obstructions.
- Look behind and down before backing up to ensure a clear path. Use extra care when operating in reverse.
- Do not jerk the controls; use a steady motion.
- When loading or unloading the machine, use one full-width ramp that is wide enough to extend beyond the width of the machine.
- Do not carry passengers.
- Do not carry equipment on the machine.

Slope Operation

All slopes and ramps require extra caution. If you feel uneasy on a slope, do not mow it.

- Remove obstacles such as rocks, tree limbs, etc. from the mowing area.
- Watch for holes, ruts or bumps.

Note: Tall grass can hide obstacles.

- Use caution near drop-offs, ditches, or embankments.

Note: The machine could suddenly turn over if a wheel goes over the edge of a cliff or ditch, or if an edge caves in.

- Use extra care with grass catchers or other attachments.

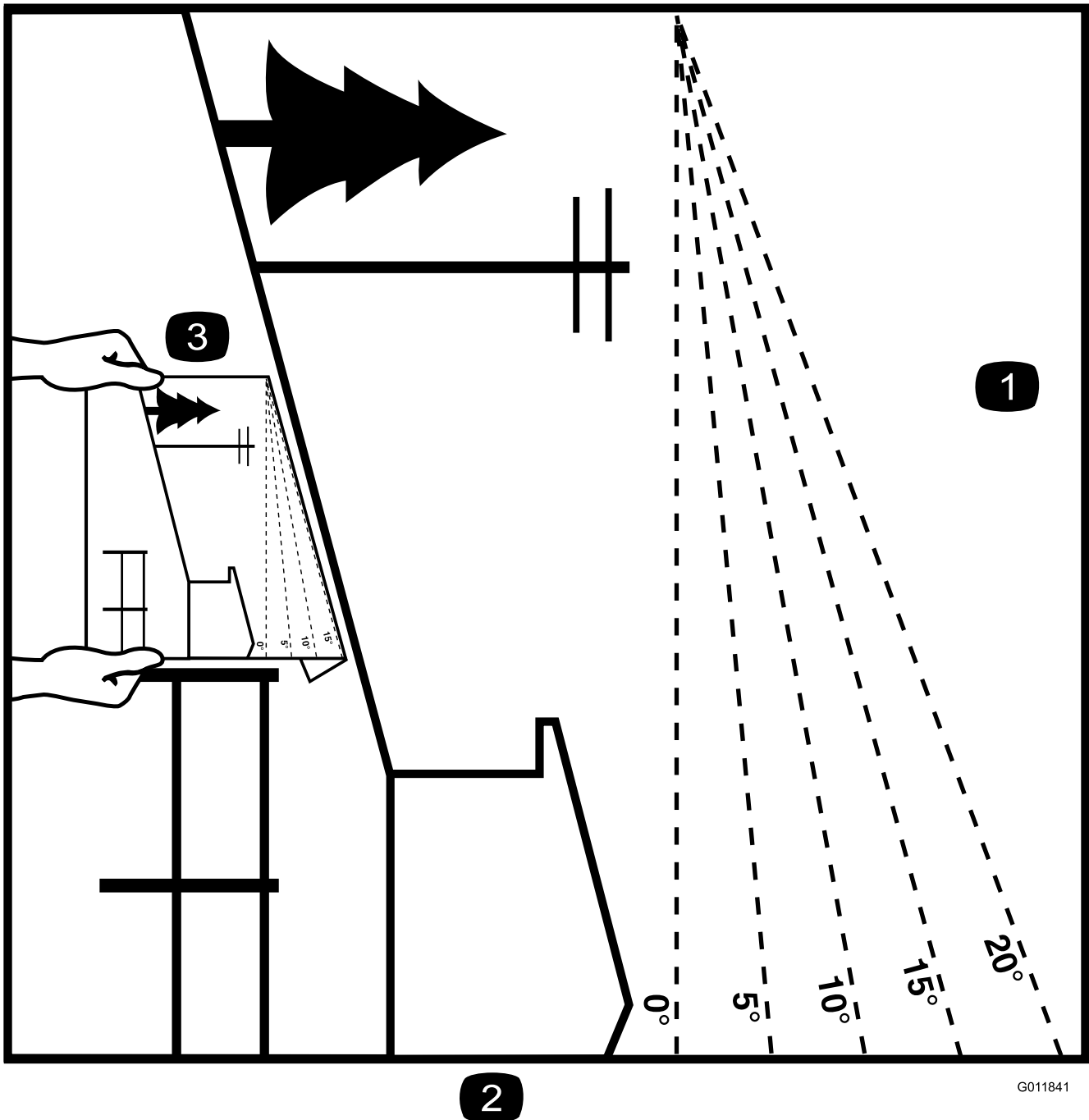
Note: These can change the stability of the machine.

- Keep all movement on slopes slow and gradual.
- Do not make sudden changes in speed or direction.
- Mow slopes side to side.
- Do not mow slopes greater than 20 degrees.

Service

- Do not store the machine or a fuel container inside where there is an open flame, such as near a water heater or furnace.
- Keep the nuts and bolts tight, especially the blade-attachment bolts.
- Never interfere with the intended function of a safety device or reduce the protection provided by a safety device. Check their proper operation regularly.
- To best protect your investment and maintain optimal performance of your Toro equipment, count on Toro genuine parts. When it comes to reliability, Toro delivers replacement parts designed to the exact engineering specifications of our equipment. For peace of mind, insist on Toro genuine parts.
- Check brake operation frequently. Adjust and service as required.

Slope Indicator



2

G011841

Figure 3

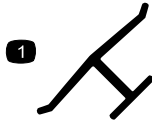
This page may be copied for personal use.

1. The maximum slope you can safely operate the machine on is **20 degrees**. Use the slope chart to determine the degree of slope of hills before operating. **Do not operate this machine on a slope greater than 20 degrees**. Fold along the appropriate line to match the recommended slope.
2. Align this edge with a vertical surface, a tree, building, fence pole, etc.
3. Example of how to compare slope with folded edge.

Safety and Instructional Decals



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



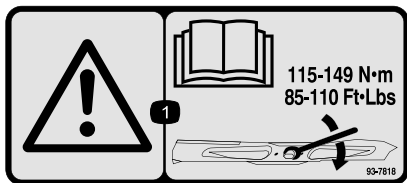
Manufacturer's Mark

1. Indicates the blade is identified as a part from the original machine manufacturer.



93-7010

1. Thrown object hazard—keep bystanders a safe distance from the machine.
2. Thrown object hazard, mower—keep the deflector in place.
3. Cutting/dismemberment of hand or foot—stay away from moving parts.



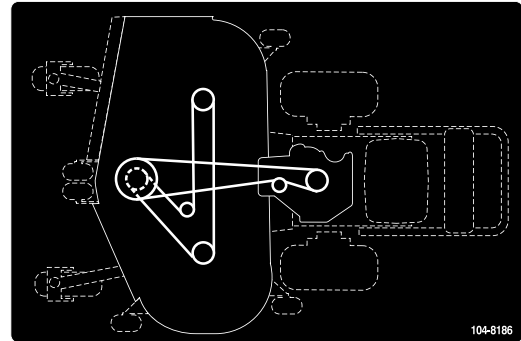
93-7818

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



93-7828

1. Thrown object hazard, mower—keep the deflector in place.
2. Cutting/dismemberment of hand or foot—stay away from moving parts.



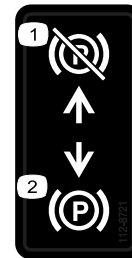
104-8186

48 inch mower



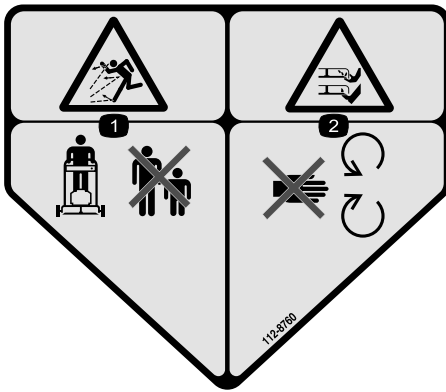
106-5517

1. Warning—do not touch the hot surface.



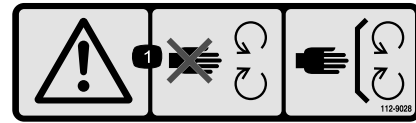
112-8721

1. Parking brake—off
2. Parking brake—on



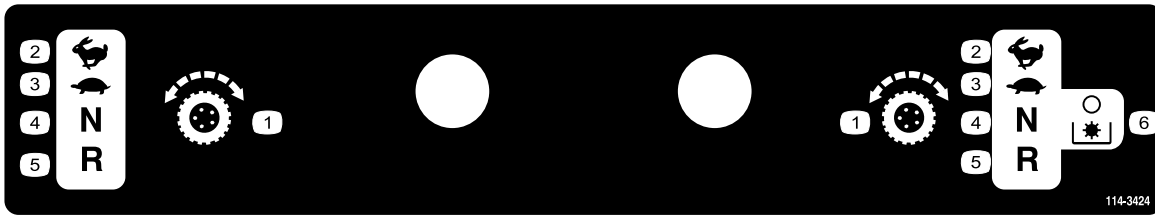
112-8760

1. Thrown object hazard—keep bystanders a safe distance from the machine.
2. Cutting/dismemberment of hand or foot—stay away from moving parts.



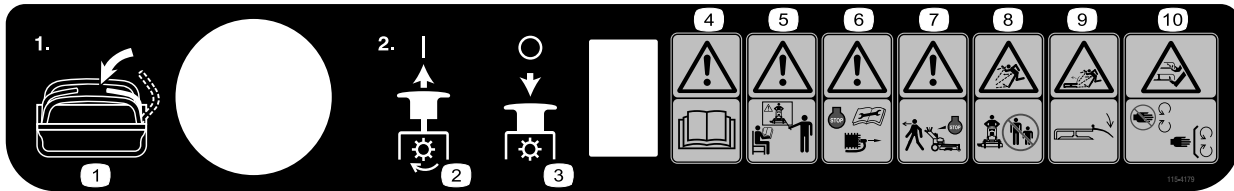
112-9028

1. Warning—stay away from moving parts; keep all guards in place.



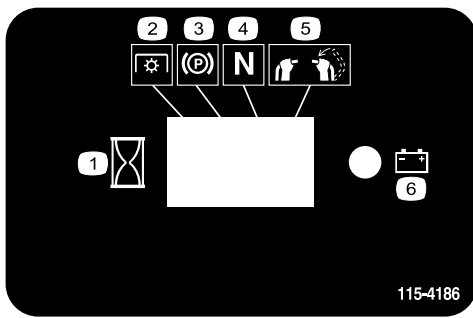
114-3424

- | | | |
|---------------------|------------|---------------------------------------|
| 1. Traction control | 3. Slow | 5. Reverse |
| 2. Fast | 4. Neutral | 6. Disengage the PTO (Power Take Off) |



115-4179

1. Move the motion control lever to the neutral position, then pull out on PTO (Power Take Off) switch to engage the blades.
2. Pull out on the PTO (Power Take Off) to engage the blades.
3. Push in on the PTO (Power Take Off) to disengage the blades.
4. Warning—read the *Operator's Manual*.
5. Warning—do not operate this machine unless you are trained.
6. Warning—stop the engine and remove the spark plug wire before performing any maintenance on the machine.
7. Warning—stop the engine before leaving the machine.
8. Thrown object hazard—keep bystanders a safe distance from the machine.
9. Thrown object hazard—keep deflector in place.
10. Cutting, dismemberment hazard of hand or foot—stay away from moving parts; keep all guards and shields in place.



115-4186

1. Interval
2. Power Take-off (PTO)
3. Parking brake
4. Neutral
5. Operator presence switch
6. Battery



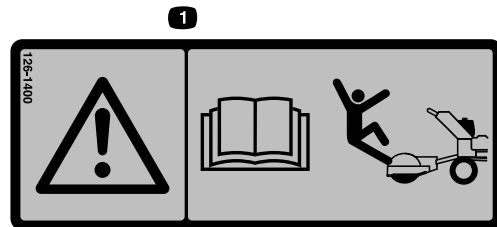
115-4189

1. Fast
2. Engine speed
3. Slow
4. Choke



115-4212

1. Hydraulic oil level
2. Read the *Operator's Manual*.
3. Warning—do not touch the hot surface.

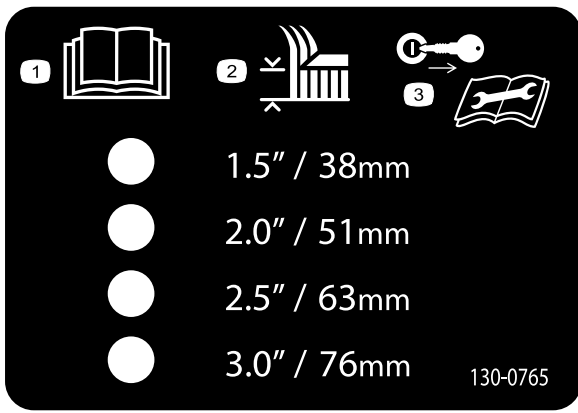


126-1400

1. Warning—Read the Operator's manual. Use only Toro riding attachments. Use of other riding attachments may create a hazardous condition resulting in injury.

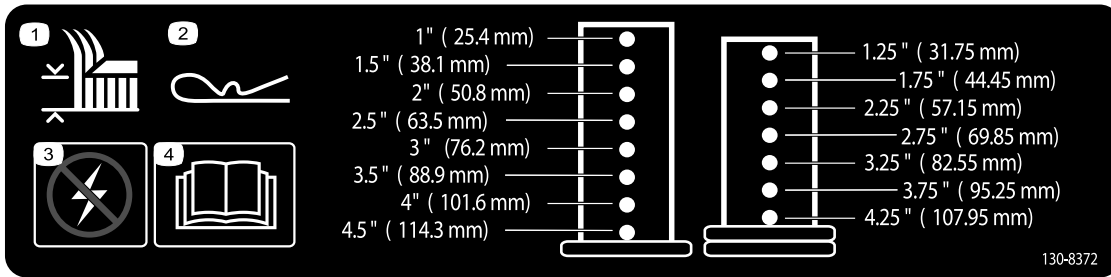
CALIFORNIA SPARK ARRESTER WARNING
 Operation of this equipment may create sparks that can start fires around dry vegetation. A spark arrester may be required. The operator should contact local fire agencies for laws or regulations relating to fire prevention requirements. 117-2718

117-2718



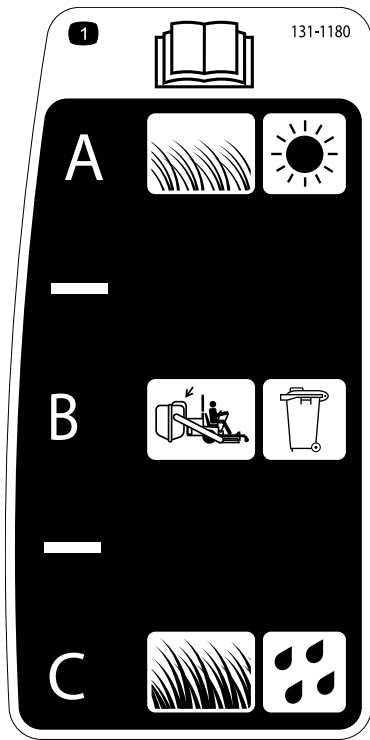
130-0765

1. Read the *Operator's Manual*.
2. Height-of-cut selection
3. Remove the key from the ignition and read the *Operator's Manual* before performing maintenance.



130-8372

1. Height-of-cut
2. Hairpin cotter
3. Turn off power before changing height-of-cut.
4. Read the *Operator's Manual*.



131-1180

Product Overview

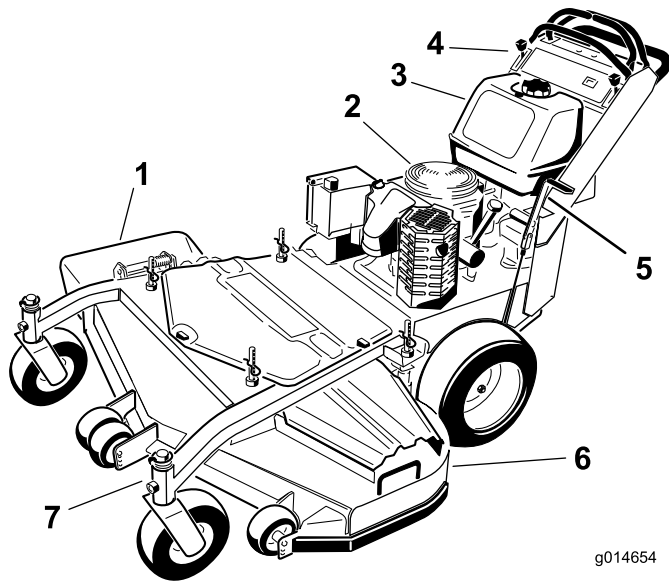


Figure 4

- | | |
|-------------------------|-----------------------|
| 1. Side-discharge chute | 5. Parking brake |
| 2. Engine | 6. Mower deck |
| 3. Gas tank | 7. Front caster wheel |
| 4. Controls | |

Controls

Become familiar with all the controls (Figure 5) before you start the engine and operate the machine.

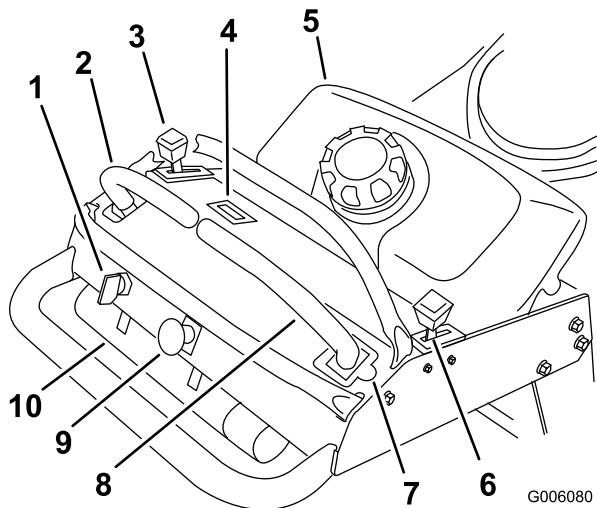


Figure 5

- | | |
|------------------------------|---|
| 1. Ignition switch | 6. Choke |
| 2. Left motion-control lever | 7. Neutral-lock position for right motion-control lever |
| 3. Throttle control | 8. Right motion-control lever |
| 4. Hour meter | 9. Blade-control switch (PTO) |
| 5. Fuel tank | 10. Operator Manual tube |

Hour Meter

The hour meter records the number of hours the engine has operated. It operates when the engine is running. Use these times for scheduling regular maintenance (Figure 6).

Safety-Interlock Indicators

There are symbols on the hour meter and indicate with a black triangle that the interlock component is in the correct position (Figure 6).

Battery-Indicator Light

When the ignition key is initially turned to the **On** position, the battery voltage will be displayed in the area where the hours are normally displayed.

The battery light turns on when the ignition is turned on and when the charge is below the correct operating level (Figure 6).

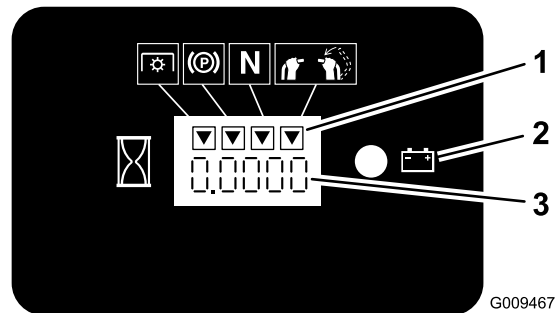


Figure 6

- | | |
|-----------------------------|---------------|
| 1. Safety-interlock symbols | 3. Hour meter |
| 2. Battery light | |

Throttle Control

The throttle control has 2 positions: Fast and Slow.

Choke

Use the choke to start a cold engine.

Blade-Control Switch (PTO)

The blade-control switch (PTO) is used to engage the electric clutch to drive the mower blades with the right side motion-control lever in the center, unlocked position. Pull the switch up to engage the blades and release. To disengage the blades, push the blade-control switch (PTO) down or move or release the right side motion-control lever into the Neutral-Lock position.

Ignition Switch

This switch is used to start the mower engine and has 3 positions: Start, Run, and Off.

Motion-Control Levers

The motion-control levers are used to drive the machine forward, reverse, and turn either direction.

Neutral-Lock Position

The neutral-lock position is used with the safety-interlock system to engage and disengage the mower blades and to determine the neutral position.

Fuel-Shutoff Valve

Close the fuel-shutoff valve (under the fuel tank) when transporting or storing the mower.

Attachments/Accessories

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

Specifications

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

48-inch mowers:

Width with deflector down	161 cm (63.5 inches)
Length	198 cm (77.7 inches)
Height	117 cm (46 inches)
Weight	309 kg (682 lb)

52-inch mowers:

Width with deflector down	172 cm (67.6 inches)
Length	198 cm (77.7 inches)
Height	117 cm (46 inches)
Weight	327 kg (721 lb)

Operation

Adding Fuel

- For best results, use only clean, fresh (less than 30 days old), unleaded gasoline with an octane rating of 87 or higher ((R+M)/2 rating method).
- **Ethanol:** Gasoline with up to 10% ethanol (gasohol) or 15% MTBE (methyl tertiary butyl ether) by volume is acceptable. Ethanol and MTBE are not the same. Gasoline with 15% ethanol (E15) by volume is not approved for use. **Never use gasoline that contains more than 10% ethanol by volume**, such as E15 (contains 15% ethanol), E20 (contains 20% ethanol), or E85 (contains up to 85% ethanol). Using unapproved gasoline may cause performance problems and/or engine damage which may not be covered under warranty.
- **Do not** use gasoline containing methanol.
- **Do not** store fuel either in the fuel tank or fuel containers over the winter unless a fuel stabilizer is used.
- **Do not** add oil to gasoline.

⚠ DANGER

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

- **Fill the fuel tank outdoors, in an open area, when the engine is cold. Wipe up any gasoline that spills.**
- **Never fill the fuel tank inside an enclosed trailer.**
- **Do not fill the fuel tank completely full. Add gasoline to the fuel tank until the level is 6 to 13 mm (1/4 to 1/2 inch) below the bottom of the filler neck. This empty space in the tank allows gasoline to expand.**
- **Never smoke when handling gasoline, and stay away from an open flame or where gasoline fumes may be ignited by a spark.**
- **Store gasoline in an approved container and keep it out of the reach of children. Never buy more than a 30-day supply of gasoline.**
- **Do not operate without entire exhaust system in place and in proper working condition.**

⚠ DANGER

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

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

⚠ WARNING

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

- **Avoid prolonged breathing of vapors.**
- **Keep face away from nozzle and gas tank or conditioner bottle opening.**
- **Avoid contact with skin; wash off spillage with soap and water.**

Using Stabilizer/Conditioner

Use a fuel stabilizer/conditioner in the machine to provide the following benefits:

- Keeps gasoline fresh during storage of 90 days or less. For longer storage it is recommended that the fuel tank be drained.
- Cleans the engine while it runs
- Eliminates gum-like varnish buildup in the fuel system, which causes hard starting

Important: Do not use fuel additives containing methanol or ethanol.

Add the correct amount of gas stabilizer/conditioner to the gas.

Note: A fuel stabilizer/conditioner is most effective when mixed with fresh gasoline. To minimize the chance

of varnish deposits in the fuel system, use fuel stabilizer at all times.

Filling the Fuel Tank

1. Shut the engine off and set the parking brake.
2. Clean around the fuel tank cap and remove the cap. Add unleaded regular gasoline to the fuel tank, until the level is 6 to 13 mm (1/4 to 1/2 inch) below the bottom of the filler neck. This space in the tank allows the gasoline to expand. Do not fill the fuel tank completely full.
3. Install the fuel tank cap securely. Wipe up any gasoline that may have spilled.

Checking the Engine-Oil Level

Before you start the engine and use the machine, check the oil level in the engine crankcase; refer to [Checking the Engine-Oil Level \(page 27\)](#).

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

Putting Safety First

Carefully read all the safety instructions and decals in the safety section. Knowing this information could help you or any bystanders avoid injury.

The use of protective equipment for eyes, hearing, feet and head is recommended.

⚠ CAUTION

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

Wear hearing protection when operating this machine.

The use of protective equipment for eyes, ears, feet, and head is recommended.

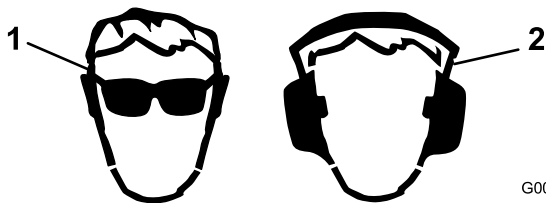


Figure 7

1. Wear safety glasses
2. Wear hearing protection

Operating the Parking Brake

Always set the parking brake when you stop the machine or leave it unattended. Before each use, check the parking brake for proper operation.

If the parking brake does not hold securely, adjust it; refer to [Setting the Parking Brake \(page 16\)](#).

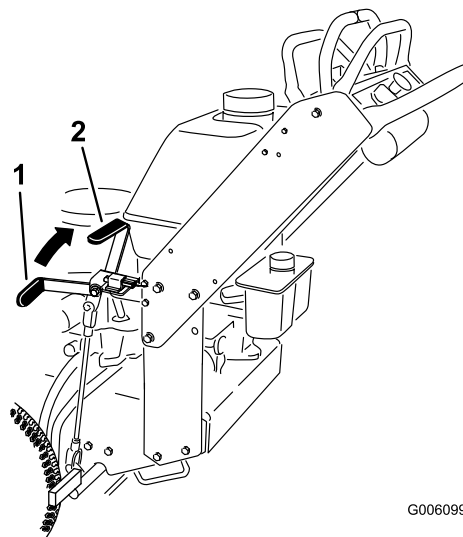
⚠ CAUTION

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

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

Setting the Parking Brake

Pull the parking-brake lever rearward ([Figure 8](#)).



G006099

Figure 8

1. Parking-brake lever (in the released position)
2. Parking-brake lever (in the engaged position)

Releasing the Parking Brake

Push the parking-brake lever forward.

Starting and Stopping the Engine

Starting the Engine

1. Connect the wires to the spark plugs.
2. Open the fuel valve.
3. Set the parking brake.

4. Move the throttle control to Fast, and move the choke lever to the On position before starting a cold engine (Figure 9).

Note: A warm or hot engine may not require choking. To start a warm engine, move throttle control midway between the **Fast** and **Slow** positions.

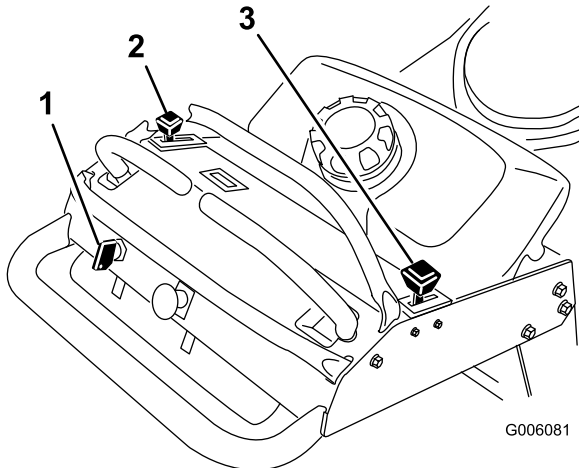


Figure 9

- | | |
|--------------------|----------|
| 1. Ignition switch | 3. Choke |
| 2. Throttle lever | |

5. Turn the ignition key to the start position to energize the starter.

Note: When the engine starts, release the key.

Note: Do not engage the starter for more than 5 seconds at a time. If the engine fails to start, allow for a 15-second cool-down period between attempts. Failure to follow these instructions can burn out the starter motor.

6. When engine starts, move the throttle control between the Fast and Slow position, and move the choke lever to the Off position.
7. Allow the engine to warm up and then move the throttle control to the Fast position.

Stopping the Engine

1. Move the motion-control levers to neutral and move the right side motion-control lever into the neutral-lock position.
2. Move the throttle lever to Slow (Figure 9).
3. If the engine has been working hard or is hot, let the engine idle for 30 to 60 seconds before turning the engine off.
4. To stop the engine, turn the ignition key to off.

Important: Ensure that the fuel-shutoff valve is closed before transporting or storing the machine, as fuel leakage may occur. Before storing the machine, pull wire off spark plug(s) to prevent possibility of accidental starting.

Operating the Mower-Blade Control (PTO)

The blade-control switch (PTO) is used in conjunction with the right side motion-control lever to engage and disengage the mower blades.

Engaging the Mower Blades (PTO)

1. To engage the mower blades, move the right side motion-control lever to the center, unlocked position (Figure 10).
2. Pull the blade-control switch (PTO) up and release it while holding down the right side motion-control lever in the center, unlocked position.

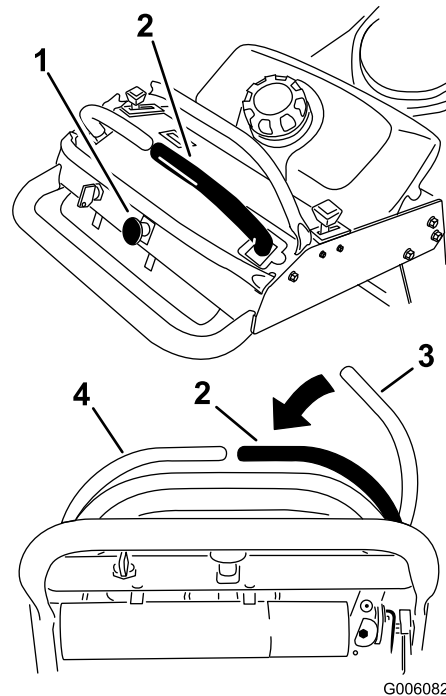


Figure 10

- | | |
|---|--|
| 1. Blade-control switch (PTO) | 3. Right motion-control lever in neutral-lock position |
| 2. Right side motion-control lever pushed down into the center, unlocked position | 4. Left motion-control lever |

Disengaging the Mower Blades (PTO)

The following are 2 options for disengaging the mower blades.

- Push the blade-control switch (PTO) down to the Off position.
- Move the motion-control levers to neutral, and move the right side motion-control lever into the neutral-lock position.

Using the Safety-Interlock System

⚠ 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.

Understanding the Safety-Interlock System

The safety-interlock system is designed to prevent the mower blades from rotating unless:

- The right side motion-control lever is moved to the center, unlocked position.
- The blade-control switch (PTO) is pulled to the On position.

The safety-interlock system is designed to stop the mower blades if you move or release the right side motion-control lever into the neutral-lock position.

The hour meter has symbols to notify the user when the interlock component is in the correct position. When the component is in the correct position, a triangle will light up in the corresponding square.

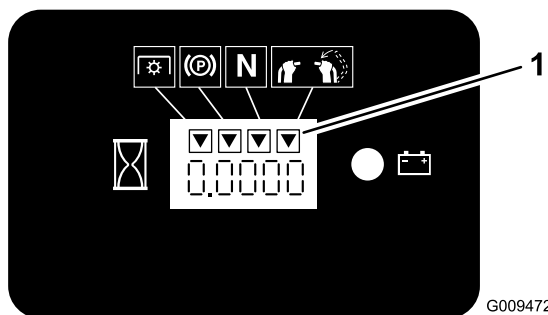


Figure 11

1. Triangles light up when the interlock components are in the correct position

Testing the Safety-Interlock System

Service Interval: Before each use or daily

Test the safety-interlock system before you use the machine each time.

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

1. Start the engine; refer to [Starting the Engine \(page 16\)](#).

2. Set the parking brake.
3. Move the right side motion-control lever to the center, unlocked position.

Note: The blades should not rotate.

4. Move the motion-control levers forward.

Note: The engine should stop.

5. Start the engine and release the parking brake.
6. Move the right side motion-control lever to the center, unlocked position.
7. Continue holding the right side motion-control lever in the center, unlocked position, and pull up on the blade-control switch (PTO) and release.

Note: The clutch should engage and the mower blades should begin to rotate.

8. Move or release the right side motion-control lever into the neutral-lock position.

Note: The blades should stop rotating.

9. Move the right side motion-control lever to the center, unlocked position.

10. Continue holding the right side motion-control lever in the center, unlocked position, and pull up on the blade-control switch (PTO) and release.

Note: The clutch should engage and the mower blades should begin to rotate.

11. Push the blade-control switch (PTO) down to the Off position.

Note: The blades should stop rotating.

12. With the engine running, pull up the blade-control switch (PTO), and release it without holding right side motion-control lever to the center, unlocked position.

Note: The blades should not rotate.

Driving Forward or Backward

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

⚠ CAUTION

The machine can spin very rapidly, causing the operator to lose control of machine, which could cause personal injury or damage to the machine.

- Use caution when making turns.
- Slow the machine down before making sharp turns.

Driving Forward

1. Release the parking brake; refer to [Releasing the Parking Brake \(page 16\)](#).
2. Move the right side motion-control lever to the center, unlocked position.
3. To go forward, slowly push the motion-control levers forward ([Figure 12](#)).

Note: The engine will stop if the traction-control levers are moved with the parking brake engaged.

To go straight, apply equal pressure to both motion-control levers ([Figure 12](#)).

To turn, move the motion-control lever toward neutral in the direction you want to turn ([Figure 12](#)).

The farther you move the traction-control levers in either direction, the faster the machine will move in that direction.

To stop, pull the motion-control levers back to the neutral position.

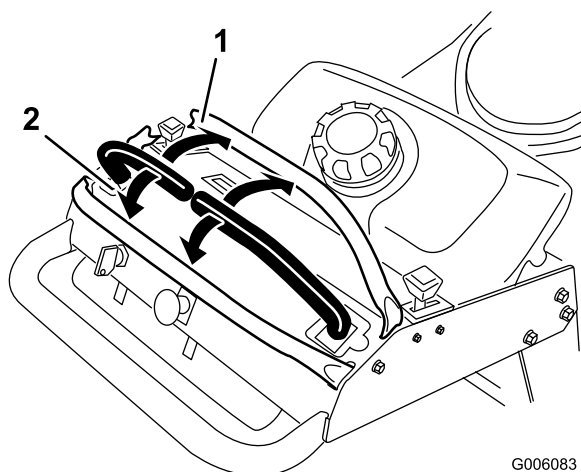


Figure 12

1. Forward

2. Backward

Driving Backward

1. Move the right side motion-control lever to the center, unlocked position.
2. To go backward, slowly pull the motion-control levers rearward ([Figure 12](#)).

To go straight, apply equal pressure to both motion-control levers ([Figure 12](#)).

To turn, release pressure on the motion-control lever toward the direction you want to turn ([Figure 12](#)).

To stop, push the motion-control levers to the neutral position.

Stopping the Machine

To stop the machine, move the motion-control levers to neutral, move the right side motion-control lever into the neutral-lock position, disengage the power take off (PTO), and turn the ignition key to off.

Set the parking brake when you leave the machine; refer to [Setting the Parking Brake \(page 16\)](#). Remember to remove the key from the ignition switch.

CAUTION

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

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

Pushing the Machine by Hand

The bypass valves allow the machine to be pushed by hand without the engine running.

Important: Always push the machine by hand. Never tow the machine because hydraulic damage may occur.

1. Disengage the PTO, move the motion-control levers to the neutral-locked position, and set the parking brake.
2. Open the bypass valve on both pumps by turning them counterclockwise 1 to 2 turns ([Figure 13](#)).

Note: This allows hydraulic fluid to bypass the pumps and the wheels to turn.

Note: Rotate the bypass valves a maximum of 2 turns, so the valve does not come out of the body causing fluid to run out.

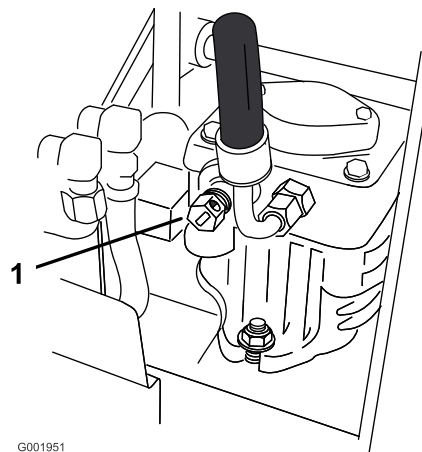


Figure 13

1. Pump bypass valve

3. Release the parking brake.
4. Push the machine to the desired location.
5. Set the parking brake.

6. Close the bypass valves, but do not overtighten them.

Important: Do not start or operate the machine with the bypass valves open. Damage to the system may occur.

Transporting the Machine

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

To transport the machine:

1. If using a trailer, connect it to the towing vehicle, and connect the safety chains.
2. If applicable, connect the trailer brakes.
3. Load the machine onto the trailer or truck.
4. Stop the engine, remove the key, set the brake, and close the fuel valve.
5. Use the metal tie-down loops on the machine to securely fasten the machine to the trailer or truck with straps, chains, cable, or ropes (Figure 14).
6. Fasten the front of the machine to the trailer or truck with straps, chains, cable, or ropes.

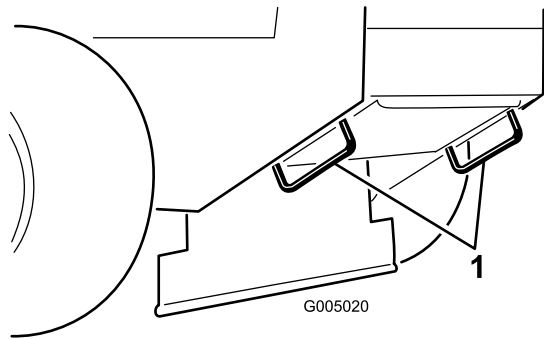


Figure 14

1. Traction unit tie-down loop

Side Discharging or Mulching the Grass

This mower has a hinged grass deflector that disperses clippings to the side and down toward the turf.

⚠ DANGER

Without the grass deflector, discharge cover, or complete grass catcher assembly mounted in place, you and others are exposed to blade contact and thrown debris. Contact with rotating mower blade(s) and thrown debris will cause injury or death.

- Never remove the grass deflector from the mower because the grass deflector routes material down toward the turf. If the grass deflector is ever damaged, replace it immediately.
- Never put your hands or feet under the mower.
- Never try to clear discharge area or mower blades unless you release the bail and the power take off (PTO) is off. Rotate the ignition key to Off. Also remove the key and pull the wire(s) off the spark plug(s).

Adjusting the Height-of-Cut

The height-of-cut can be adjusted from 25 to 114 mm (1 to 4-1/2 inches) in 6 mm (1/4 inch) increments. Adjustment is done by relocating the 4 hairpin cotters in different hole locations and by adding or removing spacers.

Note: All height-of-cut pins need at least one spacer, or damage can occur to the bushing if none are used.

Note: All height-of-cut pins can use 2 spacers maximum.

1. Select the hole height-of-cut post and number of spacers corresponding to the height-of-cut desired (Figure 15).
2. Using the lift handle, raise side of deck, and remove the hairpin cotter (Figure 15).
3. Add or remove spacers if needed, align the holes, and insert the hairpin cotter (Figure 15).

Note: Spare height-of-cut spacers may be stored on posts and retained by a hairpin cotter.

Important: All 4 hairpin cotters must be in the same hole location and with the correct number of spacers for a level cut.

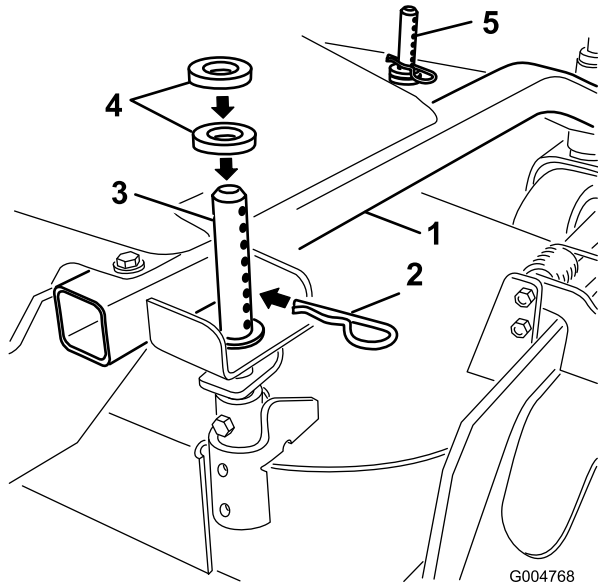
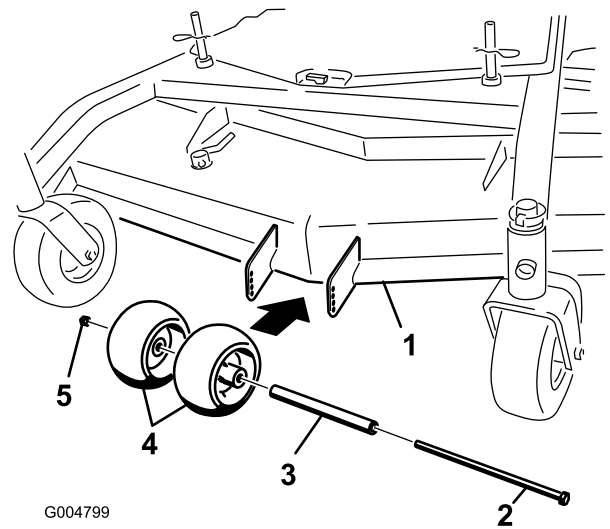


Figure 15

- | | |
|-----------------------------------|------------------------------------|
| 1. Carrier frame | 4. Spacers |
| 2. Hairpin cotter | 5. Front of the height-of-cut post |
| 3. Back of the height-of-cut post | |



G004799

Figure 16

40 inch, 48 inch, and 52 inch Mower Decks

- | | |
|---------------|-----------------------|
| 1. Mower deck | 4. Anti-scalp rollers |
| 2. Bolt | 5. Nut |
| 3. Spacer | |

Adjusting the Anti-Scalp Rollers

The anti-scalp rollers need to be adjusted in the proper hole location for each height-of-cut position. There needs to be 10 mm (3/8 inch) minimum clearance above the ground.

Note: If the anti-scalp rollers are adjusted too low, it can cause excess wear of the rollers.

1. After adjusting height-of-cut, check the anti-scalp rollers so that there is a minimum of 10 mm (3/8 inch) clearance above the ground (Figure 16, Figure 17, Figure 18).
2. If adjustment is needed, remove the bolt, washers, and nut (Figure 16, Figure 17, Figure 18).
3. Select a hole position, so the anti-scalp rollers are a minimum of 10 mm (3/8 inch) off the ground (Figure 16, Figure 17, Figure 18).
4. Install the bolt and nut (Figure 16, Figure 17, Figure 18).

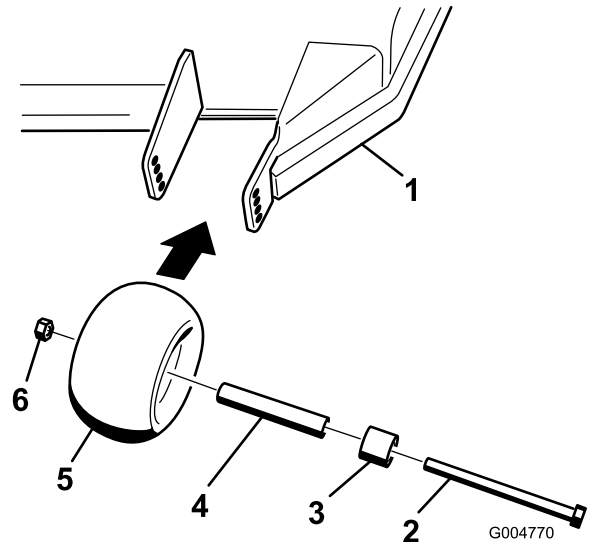
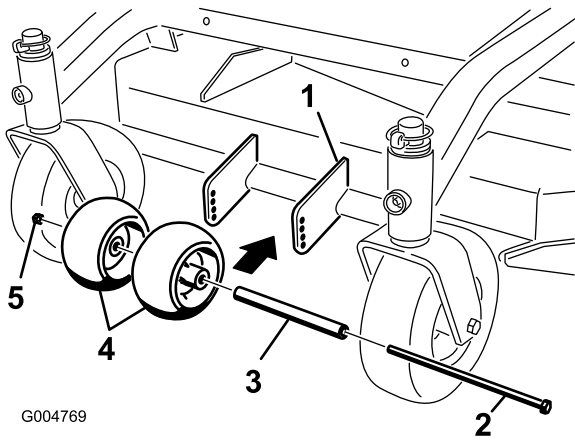


Figure 17

40 inch, 48 inch, and 52 inch Mower Decks

- | | |
|---------------|-----------------------|
| 1. Mower deck | 4. Bushing |
| 2. Bolt | 5. Anti-scalp rollers |
| 3. Spacer | 6. Nut |



G004769

Figure 18
36 inch Mower Deck

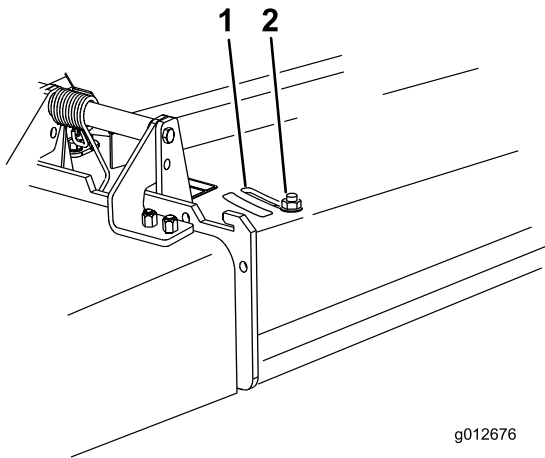
- | | |
|---------------|-----------------------|
| 1. Mower deck | 4. Anti-scalp rollers |
| 2. Bolt | 5. Nut |
| 3. Spacer | |

- In certain mowing conditions and terrain, a mismatch of cutting height may be seen. Adjusting the outside anti-scalp rollers to the minimum setting of 10 mm (3/8 inch) will help prevent the mower deck cutting too low on the outside and minimize the mismatch.

Adjusting the Flow Baffle

The mower discharge flow can be adjusted for different types of mowing conditions. Position the cam lock and baffle to give the best quality of cut.

- Disengage the PTO, move the motion-control levers to the neutral-locked position, and set the parking brake.
- Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
- To adjust the baffle, loosen the nut (Figure 19).
- Adjust the baffle and nut in the slot to the desired discharge flow, and tighten the nut.



g012676

Figure 19

- | | |
|---------|--------|
| 1. Slot | 2. Nut |
|---------|--------|

Positioning the Flow Baffle

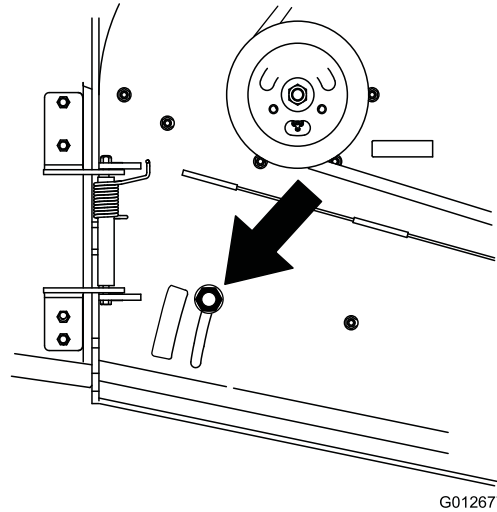
The following figures are only recommendations for use. Adjustments will vary by grass type, moisture content, and the height of the grass.

Note: If the engine power draws down and the mower ground speed is the same, open up the baffle.

Position A

This is the full rear position (see Figure 20). The suggested use for this position is as follows.

- Use for short, light grass mowing conditions.
- Use in dry conditions.
- For smaller grass clippings.
- Propels grass clippings farther away from the mower.

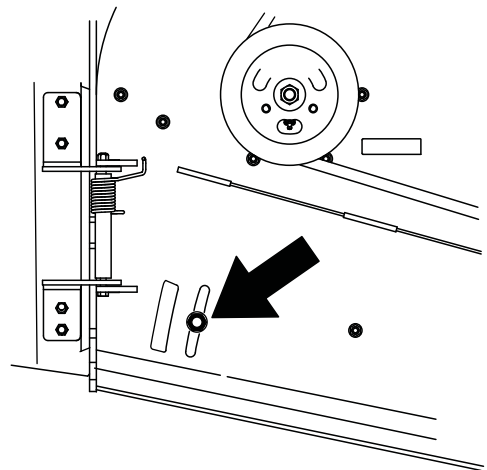


G012677

Figure 20

Position B

Use this position when bagging (Figure 21).



G012678

Figure 21

Position C

This is the full open position. The suggested use for this position is as follows (Figure 22).

- Use in tall, dense grass mowing conditions.
- Use in wet conditions.
- Lowers the engine power consumption.
- Allows increased ground speed in heavy conditions.

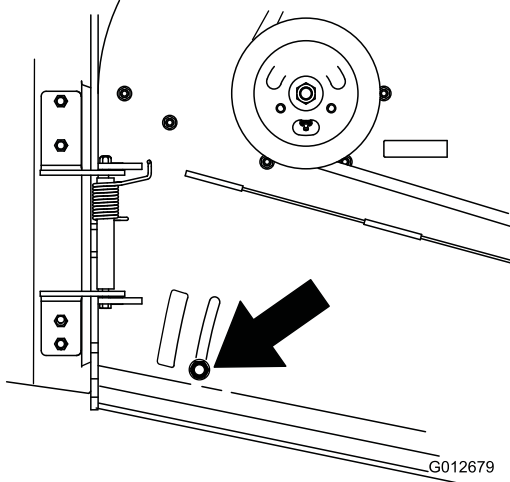


Figure 22

Using the Mid-Size Weight

Weights are installed on certain mowers to improve balance and improve performance. The weights can be moved or removed to create optimized performance under different mowing conditions and for operator preference (Figure 23 or Figure 24).

The following table indicates the position of the weight as installed at the factory.

Mower Deck Size	Number of weights install	Position of the weight
48 inches	none	none
52 inches	1	Rear

- Any rear weight must be removed when a Tru-Track[®] Sulky is installed.
- When a Tru-Track[®] Sulky is installed, front weights are needed. Contact an Authorized Service Dealer for the correct quantity of weights and placement.

▲ WARNING

The front end of the machine can rapidly rise up when the mower is removed. This could cause serious injury to you or bystanders.

Support the rear of the machine when removing the mower from the carrier frame.

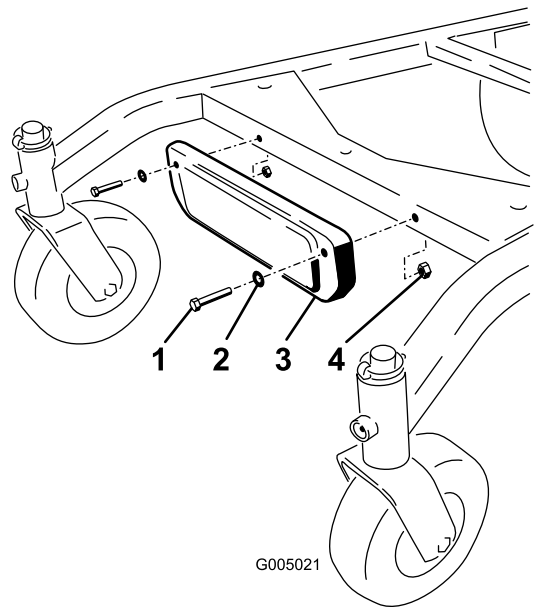


Figure 23

Installing the front weight

1. Bolt
2. Washer
3. Weight
4. Nut

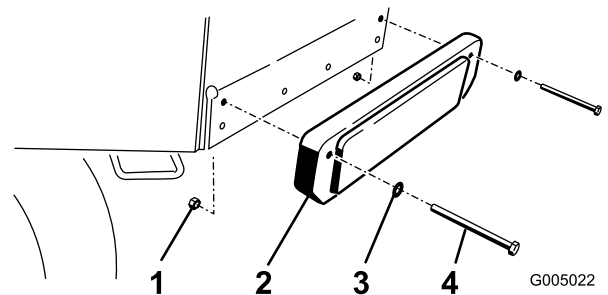


Figure 24

Installing the rear weight

1. Nut
2. Weight
3. Washer
4. Bolt

Maintenance

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

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first 8 hours	<ul style="list-style-type: none"> • Change the engine oil. • Check the hydraulic-fluid level. • Change the hydraulic filter.
Before each use or daily	<ul style="list-style-type: none"> • Check the safety-interlock system. • Grease the front caster-pivot bearing. • Check the engine-oil level. • Clean the air-intake screen. • Check the brakes. • Inspect the blades. • Clean the mower deck.
Every 25 hours	<ul style="list-style-type: none"> • Clean the foam air-cleaner element. • Check the battery-electrolyte level. • Check the hydraulic-fluid level.
Every 50 hours	<ul style="list-style-type: none"> • Grease the side bearings. • Grease the PTO belt idler. • Grease the mower-deck-belt idler. • Check the paper air-cleaner element. • Check the tire pressure. • Check the mower belt. • Check the PTO-drive belt. • Check the pump-drive belt.
Every 100 hours	<ul style="list-style-type: none"> • Change the engine oil. • Check the spark plugs. • Adjust the electric clutch. • Check the hydraulic lines.
Every 200 hours	<ul style="list-style-type: none"> • Replace the paper air-cleaner element. • Change the oil filter. • Replace the fuel filter. • Replace the fuel-vent filter.
Every 250 hours	<ul style="list-style-type: none"> • Change the hydraulic filter and the hydraulic oil when using Mobil® 1 oil.
Every 400 hours	<ul style="list-style-type: none"> • Grease the front wheel bearings (more often in dirty or dusty conditions).
Every 500 hours	<ul style="list-style-type: none"> • Change the hydraulic filter and the hydraulic oil when using Toro® HYPR-OIL™ 500 hydraulic oil.
Before storage	<ul style="list-style-type: none"> • Paint chipped surfaces. • Perform all maintenance procedures listed above before storage.

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

⚠ CAUTION

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

Remove the key from the ignition and disconnect the spark plug wires from the spark plugs before you do any maintenance. Set the wires aside so that they do not accidentally contact the spark plugs.

Lubrication

Grease with No. 2 general purpose lithium base or molybdenum base grease.

1. Disengage the PTO and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Clean the grease fittings with a rag.

Note: Make sure to scrape any paint off the front of the fitting(s).

4. Connect a grease gun to the fitting.
5. Pump grease into the fittings until grease begins to ooze out of the bearings.
6. Wipe up any excess grease.

Lubricating the Bearings

Service Interval: Before each use or daily

Every 400 hours

Every 50 hours

Lubricate the front caster-wheel bearings and the front pivots (Figure 25).

Note: Make sure the rear wheel grease caps are removed before lubricating rear wheels.

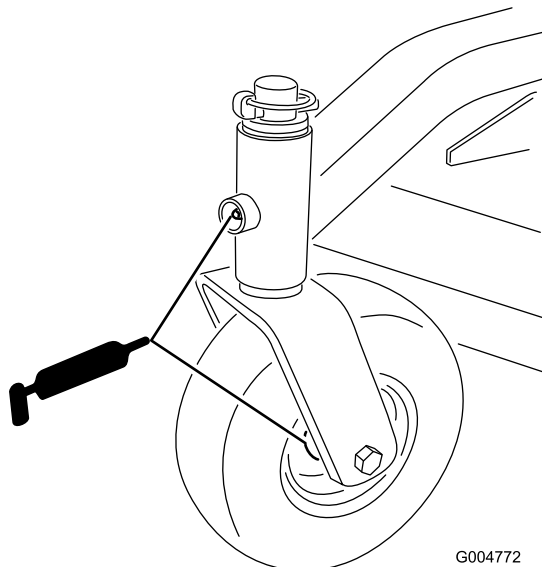


Figure 25

G004772

Greasing the PTO Drive-Belt Idler and the Mower-Deck-Belt Idler

Service Interval: Every 50 hours

Every 50 hours

Grease the idler-pulley pivots (Figure 26 or Figure 27).

Note: You will have to remove the carrier covers to access the grease fitting for the mower deck.

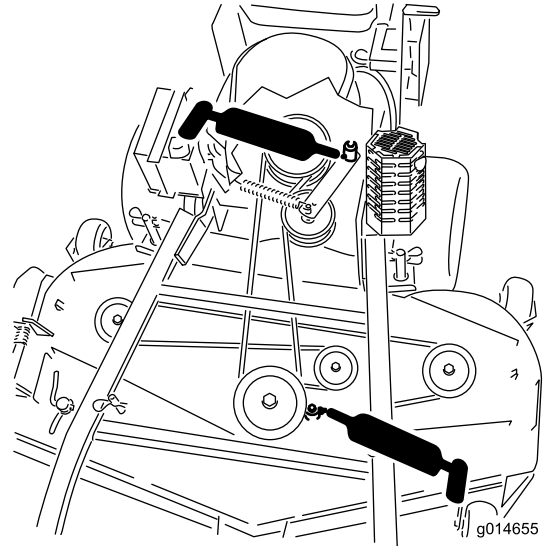


Figure 26

40-inch, 48-inch, and 52-inch mower deck shown

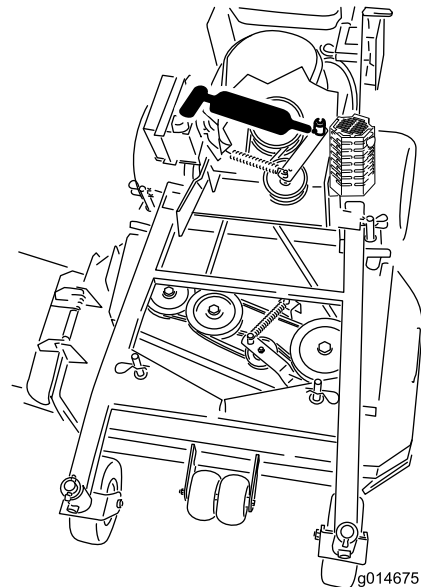


Figure 27

36-inch mower deck shown

Engine Maintenance

Servicing the Air Cleaner

Service Interval: Every 25 hours—Clean the foam air-cleaner element.

Every 50 hours—Check the paper air-cleaner element.

Every 200 hours—Replace the paper air-cleaner element.

Note: Service the air cleaner more frequently (every few operating hours) if the operating conditions are extremely dusty or sandy.

Important: Do not oil the foam or paper element.

Removing the Foam and Paper Elements

1. Disengage the PTO and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Clean around the air cleaner to prevent dirt from getting into the engine and causing damage (Figure 28).
4. Unscrew the cover knobs and remove the air-cleaner cover (Figure 28).
5. Unscrew the hose clamp and remove the air-cleaner assembly (Figure 28).
6. Carefully pull the foam element off the paper element (Figure 28).

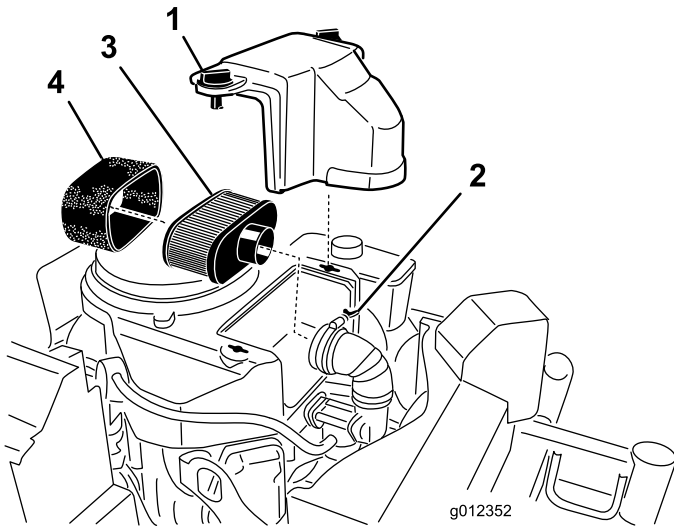


Figure 28

- | | |
|---------------|------------------|
| 1. Cover | 3. Paper element |
| 2. Hose clamp | 4. Foam element |

Cleaning the Foam Air-Cleaner Element

1. Wash the foam element in liquid soap and warm water. When the element is clean, rinse it thoroughly.

2. Dry the element by squeezing it in a clean cloth.

Important: Replace the foam element if it is torn or worn.

Servicing the Paper Air-Cleaner Element

1. Do not clean the paper filter, replace it (Figure 28).
2. Inspect the element for tears, an oily film, or damage to the rubber seal.
3. Replace the paper element if it is damaged.

Installing the Foam and Paper Elements

Important: To prevent engine damage, always operate the engine with the complete foam and paper air cleaner assembly installed.

1. Carefully slide the foam element onto the paper air-cleaner element (Figure 28).
2. Place the air-cleaner assembly onto the air-cleaner base, and secure it with the 2 wing nuts (Figure 28).
3. Place the air-cleaner cover into position and tighten the cover knob (Figure 28).

Servicing the Engine Oil

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

After the first 8 hours—Change the engine oil.

Every 100 hours—Change the engine oil.

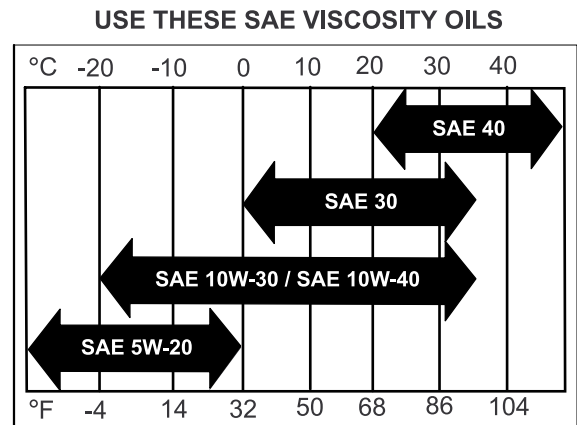
Every 200 hours—Change the oil filter.

Note: Change the oil more frequently when the operating conditions are extremely dusty or sandy.

Oil Type: Detergent oil (API service SF, SG, SH, SJ or SL)

Crankcase Capacity: 1.7 L (58 oz) with the filter removed; 1.5 L (51 oz) without the filter removed

Viscosity: Refer to the table (Figure 29).



G004216

Figure 29

Checking the Engine-Oil Level

1. Park the machine on a level surface.
2. Disengage the PTO and set the parking brake.
3. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
4. Clean around the oil dipstick (Figure 30) so that dirt cannot fall into the filler hole and damage the engine.

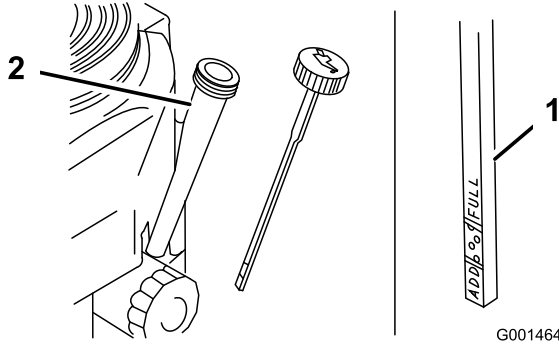


Figure 30

1. Oil dipstick
2. Filler tube

5. Unscrew the oil dipstick and wipe the end clean (Figure 30).
6. Slide the oil dipstick fully into the filler tube, but do not thread it onto the tube (Figure 30).
7. Pull the dipstick out and look at the end. If the oil level is low, slowly pour only enough oil into the filler tube to raise the level to the Full mark.

Important: Do not overfill the crankcase with oil and run the engine; engine damage can result.

Changing the Engine Oil

1. Park the machine, so that the drain side is slightly lower than the opposite side, to ensure that the oil drains completely.
2. Disengage the PTO and set the parking brake.
3. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
4. Slide the drain hose over the oil-drain valve.
5. Place a drain pan below the drain hose.
6. Rotate the oil-drain valve to allow the oil to drain (Figure 31).
7. When oil has drained completely, close the drain valve.
8. Remove the drain hose (Figure 31).

Note: Dispose of the used oil at a recycling center.

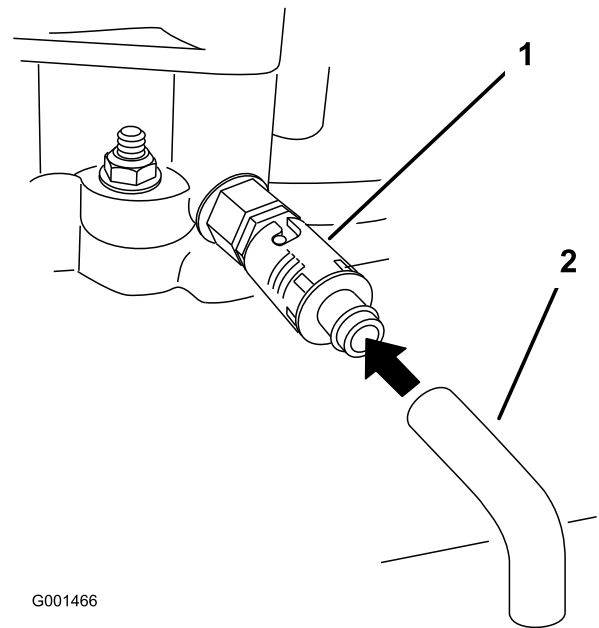


Figure 31

1. Oil-drain valve
2. Oil-drain hose

9. Slowly pour approximately 80% of the specified oil into the filler tube (Figure 30).
10. Check the oil level; refer to [Checking the Engine-Oil Level](#) (page 27).
11. Slowly add the additional oil to bring it to the **Full** mark.

Changing the Engine-Oil Filter

Note: Change the oil filter more frequently when the operating conditions are extremely dusty or sandy.

1. Drain the oil from the engine; refer to [Changing the Engine Oil](#) (page 27).
2. Remove the old filter (Figure 32).

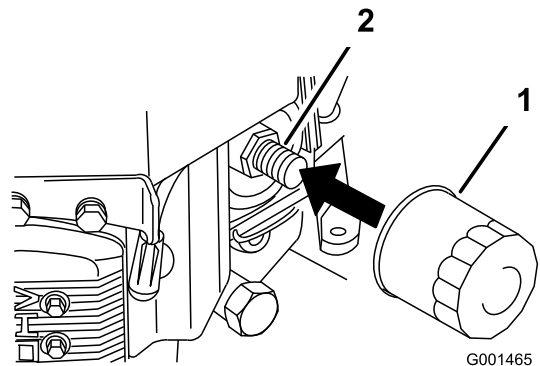


Figure 32

1. Oil filter
2. Adapter

3. Apply a thin coat of new oil to the rubber gasket on the replacement filter (Figure 32).

4. Install the replacement oil filter to the filter adapter, turn the oil filter clockwise until the rubber gasket contacts the filter adapter, then tighten the filter an additional 3/4 turn (Figure 32).
5. Fill the crankcase with the proper type of new oil; refer to Servicing the Engine Oil (page 26).
6. Run the engine for about 3 minutes, stop the engine, and check for oil leaks around the oil filter and the drain valve.
7. Check the engine-oil level and add oil if needed.
8. Wipe up any spilled oil.

Servicing the Spark Plugs

Service Interval: Every 100 hours

Ensure that the air gap between the center and side electrodes is correct before installing the spark plug. Use a spark plug wrench for removing and installing the spark plugs and a gapping tool/feeler gauge to check and adjust the air gap. Install a new spark plugs if necessary.

Type: Champion® RCJ8Y or equivalent Air Gap: 0.75 mm (0.03 inch)

Removing the Spark Plugs

1. Disengage the PTO and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Disconnect the wires from the spark plugs (Figure 33).

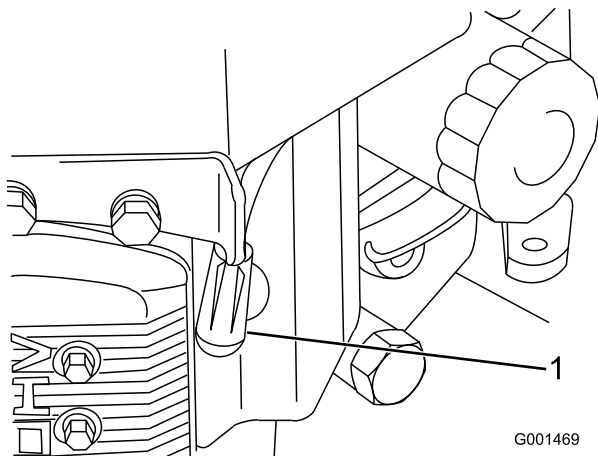


Figure 33

1. Spark-plug wire/spark plug

4. Clean around the spark plugs to prevent dirt from falling into the engine and potentially causing damage.
5. Remove the spark plugs and the metal washers.

Checking the Spark Plugs

1. Look at the center of the spark plugs (Figure 34).

Note: If you see light brown or gray on the insulator, the engine is operating properly. A black coating on the insulator usually means that the air cleaner is dirty.

2. If needed, clean the spark plug with a wire brush to remove carbon deposits.

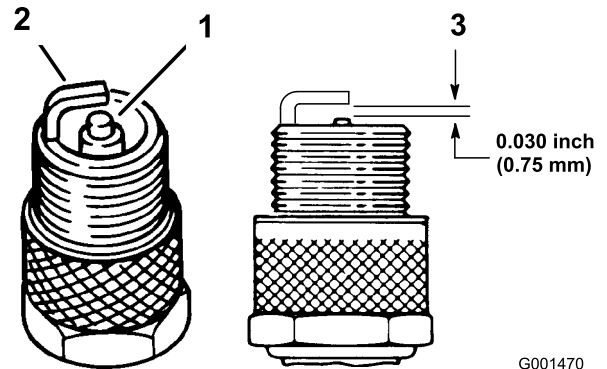


Figure 34

1. Center electrode insulator
2. Side electrode
3. Air gap (not to scale)

Important: Always replace the spark plugs when it has worn electrodes, an oily film on it, or has cracks in the porcelain.

3. Check the gap between the center and side electrodes (Figure 34). Bend the side electrode (Figure 34) if the gap is not correct.

Installing the Spark Plugs

1. Install the spark plugs and the metal washer. Ensure that the air gap is set correctly.
2. Tighten the spark plugs to 22 N-m (16 ft-lb).
3. Connect the wires to the spark plugs (Figure 34).

Fuel System Maintenance

Draining the Fuel Tank

⚠ DANGER

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

- Drain gasoline from the fuel tank when the engine is cold. Do this outdoors in an open area. Wipe up any gasoline that spills.
- Never smoke when draining gasoline, and stay away from an open flame or where a spark may ignite the gasoline fumes.

1. Park the machine on a level surface, to assure fuel tank drains completely.
2. Disengage the power take off (PTO), set the parking brake, turn the ignition key to **off**, and remove the key.
3. Close the fuel-shutoff valve at the fuel tank (Figure 35).
4. Squeeze the ends of the hose clamp together and slide it up the fuel line away from fuel filter (Figure 35).
5. Pull the fuel line off the fuel filter (Figure 35).
6. Open the fuel-shutoff valve and allow the gasoline to drain into a gas can or drain pan.

Note: Now is the best time to install a new fuel filter because the fuel tank is empty; refer to [Replacing the Fuel Filter \(page 29\)](#)

7. Install the fuel line onto the fuel filter.
8. Slide the hose clamp close to the valve to secure the fuel line.
9. Wipe up any spilled fuel.

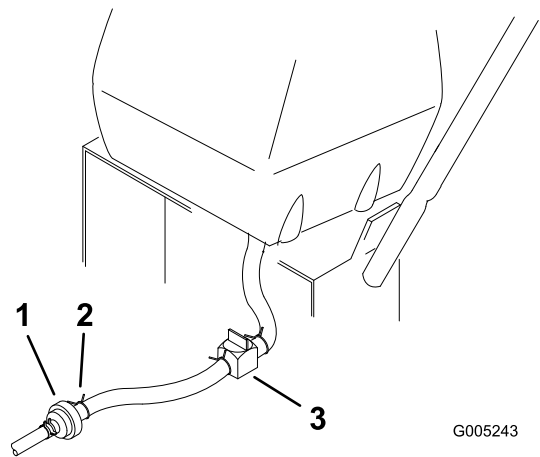


Figure 35

1. Fuel filter
2. Clamp
3. Fuel-shutoff valve

Servicing the Fuel Filter

Service Interval: Every 200 hours/Yearly (whichever comes first)

Replacing the Fuel Filter

Never install a dirty filter if it is removed from the fuel line.

Note: Note how the fuel filter is installed in order to install the new filter correctly.

Note: Wipe up any spilled fuel.

1. Disengage the PTO and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Close fuel-shutoff valve at the fuel tank (Figure 35).
4. Squeeze the ends of the hose clamps together and slide them away from the filter (Figure 36).

Servicing the Fuel-Vent System

Service Interval: Every 200 hours/Yearly (whichever comes first)

1. Disengage the PTO and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Remove the existing fuel-vent filter (Figure 37).
4. Install a new filter.

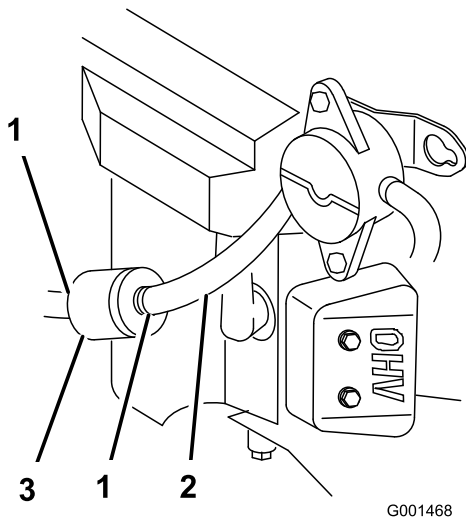


Figure 36

1. Hose clamp
2. Fuel line
3. Filter

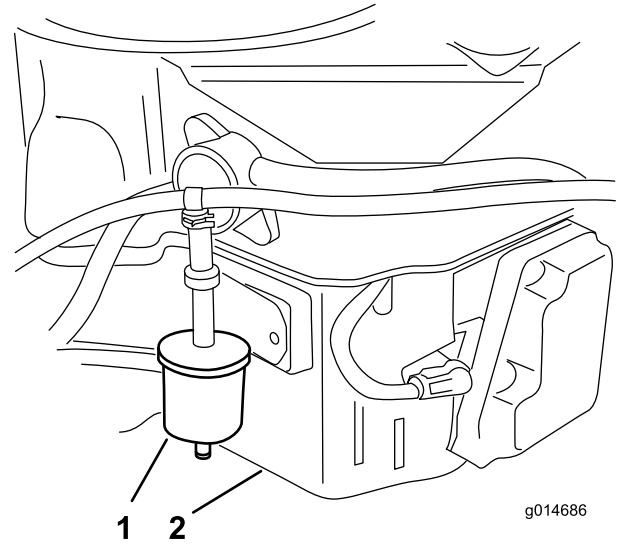


Figure 37

1. Fuel-vent filter
2. Right side of motor

5. Remove the filter from the fuel lines.
6. Install a new filter and move the hose clamps close to the filter.
7. Open fuel-shutoff valve at the fuel tank (Figure 35).
8. Check for fuel leaks and repair if needed.
9. Wipe up any spilled fuel.

Electrical System Maintenance

Servicing the Battery

Always keep the battery clean and fully charged. Use a paper towel to clean the battery case. If the battery terminals are corroded, clean them with a solution of 4 parts water and one part baking soda. Apply a light coating of grease to the battery terminals to prevent corrosion.

Voltage: 12 V

WARNING

CALIFORNIA Proposition 65 Warning

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

⚠ DANGER

Battery electrolyte contains sulfuric acid which is a deadly poison and causes severe burns.

Do not drink electrolyte and avoid contact with skin, eyes or clothing. Wear safety glasses to shield your eyes and rubber gloves to protect your hands.

Removing the Battery

⚠ WARNING

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

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

⚠ WARNING

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

- Always Disconnect the negative (black) battery cable before disconnecting the positive (red) cable.
 - Always Reconnect the positive (red) battery cable before reconnecting the negative (black) cable.
1. Disengage the PTO and set the parking brake.
 2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
 3. Lift the black rubber cover on the negative cable, and disconnect the negative battery cable from the negative (-) battery terminal (Figure 38).
 4. Slide the red terminal boot off the positive (red) battery terminal, and remove the positive (red) battery cable (Figure 38).
 5. Remove the battery hold-down plate (Figure 38) and remove the battery.

Installing the Battery

1. Place the battery onto the machine (Figure 38).
2. Secure the battery with the hold-down plate, j-bolts, and locknuts.
3. Install the positive (red) battery cable to positive (+) battery terminal with a nut, a washer, and a bolt (Figure 38).
4. Slide the rubber cover over the post.
5. Then install the negative battery cable and ground wire to the negative (-) battery terminal with a nut, a washer, and a bolt (Figure 38).
6. Slide the rubber cover over the post.

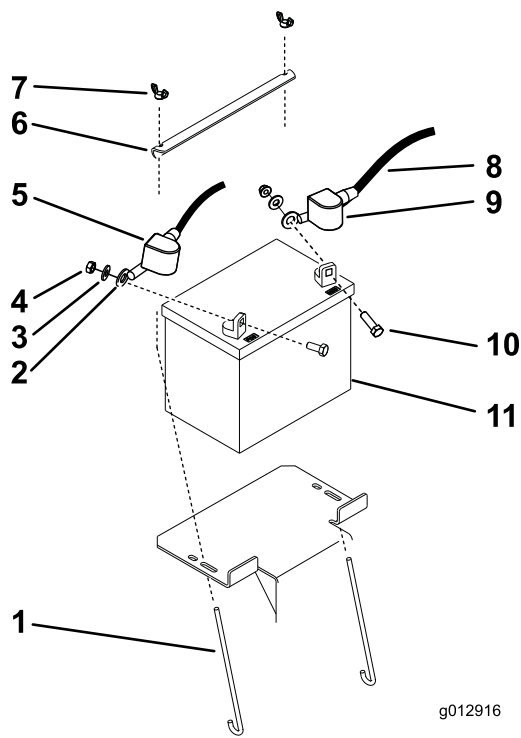


Figure 38

- | | |
|-----------------------|-------------------------|
| 1. J-bolt | 7. Wing nut |
| 2. Positive cable | 8. Negative cable |
| 3. Washer | 9. Rubber cover (black) |
| 4. Nut (5/16 inch) | 10. Bolt |
| 5. Rubber cover (red) | 11. Battery |
| 6. Battery hold down | |

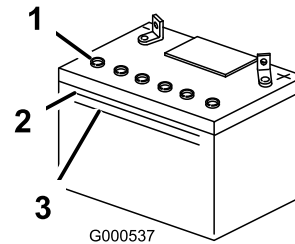


Figure 39

- | | |
|---------------|---------------|
| 1. Vent caps | 3. Lower line |
| 2. Upper line | |

- If the electrolyte is low, add the required amount of distilled water; refer to [Adding Water to the Battery](#) (page 32).

Adding Water to the Battery

The best time to add distilled water to the battery is just before you operate the machine. This lets the water mix thoroughly with the electrolyte solution.

- Remove the battery from the machine; refer to [Removing the Battery](#) (page 31).

Important: Never fill the battery with distilled water while the battery is installed in the machine. Electrolyte could be spilled on other parts and cause corrosion.

- Clean the top of the battery with a paper towel.
- Remove the vent caps from the battery ([Figure 39](#)).
- Slowly pour distilled water into each battery cell until the electrolyte level is up to the Upper line ([Figure 39](#)) on the battery case.

Important: Do not overfill the battery because electrolyte (sulfuric acid) can cause severe corrosion and damage to the chassis.

- Wait for 5 to 10 minutes after filling the battery cells.
- Add distilled water, if necessary, until the electrolyte level is up to the Upper line ([Figure 39](#)) on the battery case.
- Install the battery-vent caps.

Checking the Battery-Electrolyte Level

Service Interval: Every 25 hours

▲ DANGER

Battery electrolyte contains sulfuric acid which is a deadly poison and causes severe burns.

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

- Look at the side of the battery. The electrolyte must be up to the **upper** line ([Figure 39](#)). Do not allow the electrolyte to fall below the Lower line ([Figure 39](#)).

Charging the Battery

⚠ WARNING

Charging the battery produces gasses that can explode.

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

Important: Always keep the battery fully charged (1.265 specific gravity). This is especially important to prevent battery damage when the temperature is below 0°C (32°F).

1. Remove the battery from the chassis; refer to [Removing the Battery](#) (page 31).
2. Check the electrolyte level; refer to [Checking the Battery-Electrolyte Level](#) (page 32).
3. Make sure that the filler caps are installed in battery.
4. Charge the battery for 1 hour at 25 to 30 amps or 6 hours at 4 to 6 amps.
5. When the battery is fully charged, unplug the charger from the electrical outlet, then disconnect the charger leads from the battery posts ([Figure 40](#)).
6. Install the battery onto the machine and connect the battery cables.

Note: Do not run the machine with the battery disconnected, electrical damage may occur.

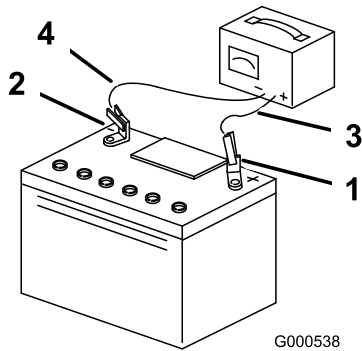


Figure 40

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

Servicing the Fuses

The electrical system is protected by fuses. It requires no maintenance. If a fuse blows, check the component or circuit for a malfunction or short.

1. Remove the cover under the control panel.
2. Pull out on the fuse to remove or replace it ([Figure 41](#)).
3. Install the cover under the control panel.

Note: Ensure that the correct-size fuse is install with the correct wire color as shown in [Figure 41](#).

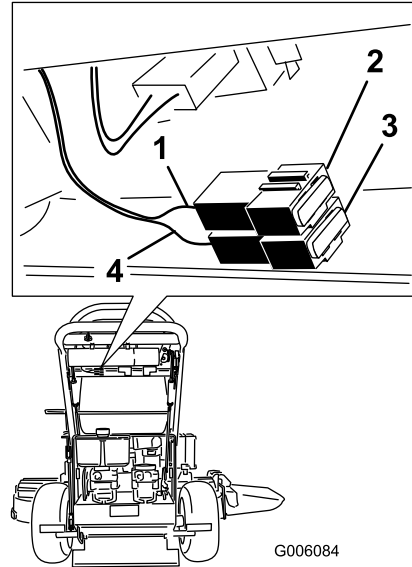


Figure 41

1. Red wire
2. Fuse—30 amp, blade type
3. Fuse—25 amp, blade type
4. Violet wire

Drive System Maintenance

Adjusting the Tracking

If the machine does not track straight, adjustment is required.

1. Check the rear tire pressure; refer to [Checking the Tire Pressure](#) (page 34).
2. Loosen the wing nuts on the right control rod, and rotate the turnbuckle in or out to ensure that the right side control lever is centered in the neutral-lock position.
3. Secure the turnbuckle in position with the wing nuts (Figure 42).
4. Loosen the wing nuts on the left control rod and rotate the turnbuckle in or out to change the tracking.
5. Secure the turnbuckle in position with the wing nuts (Figure 42).
6. Check for proper tracking.
7. Adjust the left control rod if a change is needed.

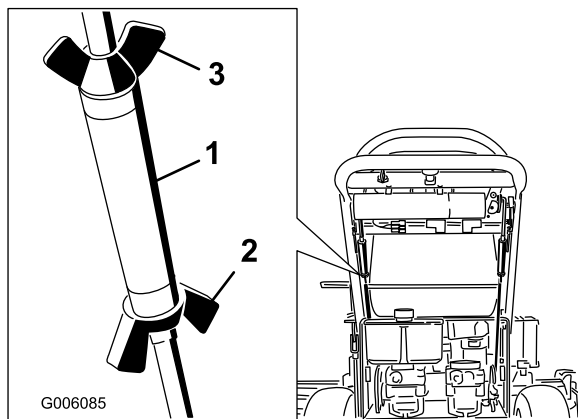


Figure 42

- | | |
|--------------------|--------------------------------------|
| 1. Turnbuckle | 3. Top wing nut (left hand threaded) |
| 2. Bottom wing nut | |

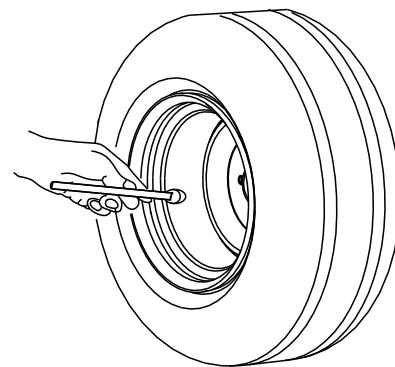
Checking the Tire Pressure

Service Interval: Every 50 hours/Monthly (whichever comes first)

Check the pressure at the valve stem (Figure 43).

Maintain the air pressure in the rear tires at 83 to 97 kPa (12 to 14 psi). Uneven tire pressure can cause an uneven cut.

Note: The front tires are semi-pneumatic tires and do not require air-pressure maintenance.



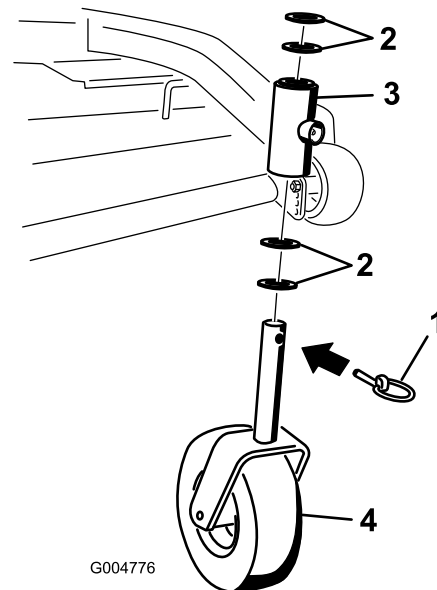
G001055

Figure 43

Replacing the Caster-Wheel-Fork Bushings

The caster-wheel forks are mounted in bushings pressed into the top and bottom of the carrier frame mounting-pivot tubes. To check the bushings, move the caster forks back and forth and side-to-side. If a caster fork is loose, the bushings are worn and must be replaced.

1. Raise the cutting unit so the caster wheels are off the floor, then support the front of the mower with jack stands.
2. Remove the locking pin and spacer(s) from the top of the caster-wheel fork (Figure 44).



G004776

Figure 44

- | | |
|----------------|-----------------------------|
| 1. Locking pin | 3. Carrier frame pivot tube |
| 2. Spacers | 4. Caster-wheel fork |

3. Pull the caster-wheel fork out of the mounting tube, leaving the spacer(s) on the bottom of the fork.

Note: Remember the location of the spacers on each fork to ensure correct installation, and to maintain a level deck.

4. Insert a pin punch into the mounting tube and carefully drive out the bushings (Figure 45).
5. Clean the inside of the mounting tube.

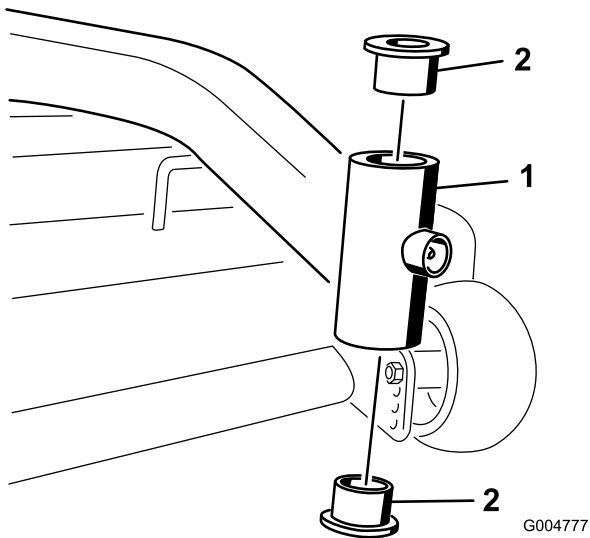


Figure 45

1. Mounting tube
2. Bushing

6. Grease the inside and outside of the new bushings.

Note: Use a hammer and flat plate to carefully drive the bushings into the pivot tubes.

7. Inspect the caster-wheel fork for wear, and replace if necessary (Figure 44).
8. Slide the caster-wheel fork through the bushings in the mounting tube.
9. Replace the spacer(s) onto the fork and secure with the retaining ring (Figure 44).

Important: The inside diameter of the bushings may collapse slightly when installed. If the caster-wheel fork does not slide into the new bushings, ream both bushings to an inside diameter of 29 mm (1.1 inches).

10. Grease the fitting on the carrier frame pivot tubes using No. 2 general purpose lithium base or molybdenum-base grease.

Servicing the Caster Wheel and Bearings

The caster wheels rotate on a roller bearing supported by a spanner bushing. If the bearing is kept well lubricated, wear will be minimal. Failure to keep the bearing well lubricated will cause rapid wear. A wobbly caster wheel usually indicates a worn bearing.

1. Remove the locknut and wheel bolt holding the caster wheel to the caster fork (Figure 46).

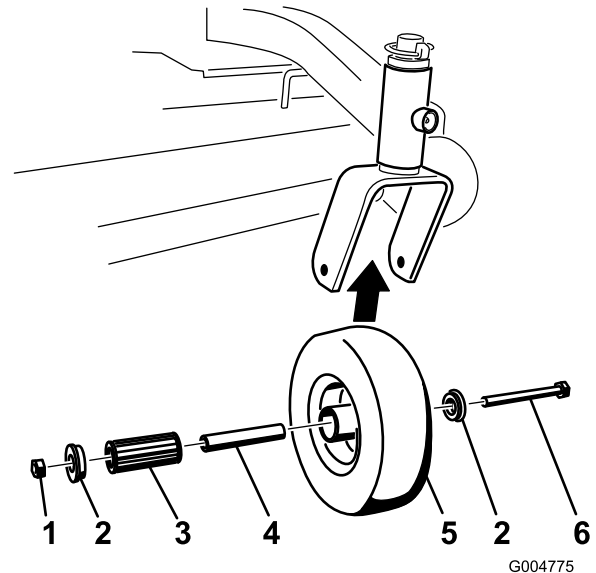


Figure 46

1. Locknut
2. Wheel bolt
3. Bushing
4. Spanner bushing
5. Roller bearing

2. Remove one bushing, then pull the spanner bushing and the roller bearing out of the wheel hub (Figure 46).
3. Remove the other bushing from the wheel hub and clean any grease and dirt from the wheel hub (Figure 46).
4. Inspect the roller bearing, bushings, spanner bushing and the inside of the wheel hub for wear. Replace any defective or worn parts (Figure 46).
5. To assemble, place one bushing into the wheel hub.
6. Grease the roller bearing and spanner bushing and slide them into the wheel hub.
7. Place the second bushing into the wheel hub (Figure 46).
8. Install the caster wheel into the caster fork, and secure with the wheel bolt and locknut.
9. Tighten the locknut until the spanner bushing bottoms against the inside of the caster forks (Figure 46).
10. Grease the fitting on the caster wheel.

Adjusting the Electric Clutch

Service Interval: Every 100 hours

The clutch is adjustable to ensure proper engagement and proper braking.

1. Insert a 0.381 to 0.533 mm (0.015 to 0.021 inch) feeler gauge through one inspection slot in the side of the assembly.

Note: Make sure it is between the armature and the rotor friction surfaces.

2. Tighten the locknuts until there is slight binding on the feeler gauge but it can be moved easily within the air gap (Figure 47).
3. Repeat this for the remaining slots.
4. Check each slot again and make slight adjustments until the feeler gauge between the rotor and armature with very slight contact between them.

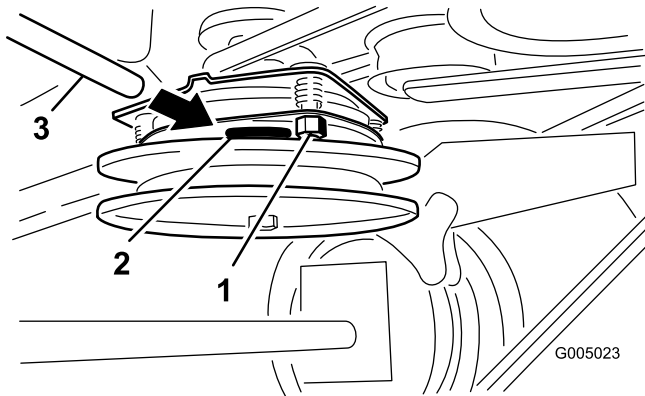


Figure 47

- | | |
|------------------|-----------------|
| 1. Adjusting nut | 3. Feeler gauge |
| 2. Slot | |

Cooling System Maintenance

Cleaning the Air-Intake Screen

Service Interval: Before each use or daily

Before each use, remove any buildup of grass, dirt, or other debris from the cylinder and cylinder head cooling fins, air-intake screen on the flywheel end, and carburetor-governor levers and linkage. This will help insure adequate cooling and correct engine speed and will reduce the possibility of overheating and mechanical damage to the engine.

Brake Maintenance

Servicing the Brake

Before each use, check the brakes on both a level surface and slope.

Always set the parking brake when you stop the machine or leave it unattended. If the parking brake does not hold securely, an adjustment is required.

Checking the Parking Brake

Service Interval: Before each use or daily

1. Park the machine on a level surface and disengage the PTO.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Apply the parking brake. Setting the parking brake should take a reasonable amount of force. If the parking brake does not hold securely, an adjustment is required; refer to [Adjusting the Parking Brake \(page 37\)](#).

Note: When the brake is engaged, the brake handle should be in the 1 o'clock position ([Figure 48](#)).

Adjusting the Parking Brake

If the parking brake does not hold securely, an adjustment is required.

1. Park the machine on a level surface, disengage the PTO, and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Check the brake before you adjust it; refer to [Checking the Parking Brake \(page 37\)](#).
4. Release the parking brake; refer to [Releasing the Parking Brake \(page 16\)](#).
5. Loosen the top and bottom jam nuts ([Figure 48](#)).
6. To adjust the brake, remove the hairpin cotter and clevis pin from the lower brake lever ([Figure 48](#)).
7. Rotate the brake rod in the yokes ([Figure 48](#)).

Note: To tighten the brake, lengthen the rod between the yokes. To loosen the brake, shorten the rod between the yokes.

Note: The brake rod should be threaded into both yokes at the same distance.

8. Secure the yoke to the lower brake lever with the hairpin cotter and the clevis pin ([Figure 48](#)).
9. Tighten the top and bottom jam nuts ([Figure 48](#)).

10. Check the brake operation again; refer to [Checking the Parking Brake \(page 37\)](#).

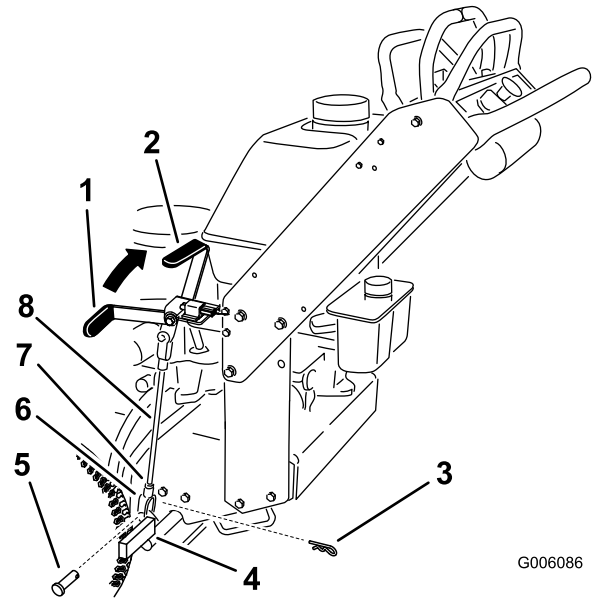


Figure 48

- | | |
|--|---------------|
| 1. Parking-brake lever (released position) | 5. Clevis pin |
| 2. 1 o'clock position | 6. Yoke |
| 3. Hairpin cotter | 7. Jam nut |
| 4. Lower brake lever | 8. Brake rod |

Belt Maintenance

Replacing the Mower Belt

Service Interval: Every 50 hours

Squealing when the belt is rotating, blades slipping when cutting grass, frayed belt edges, burn marks and cracks are signs of a worn deck belt. Replace the deck belt if any of these conditions are evident.

1. Disengage the PTO and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Unlatch and remove the carrier-frame cover.
4. Unlatch and remove the belt covers.
5. Remove the PTO drive belt; refer to [Replacing the PTO-Drive Belt \(page 39\)](#)
6. Disconnect the idler arm spring to relieve tension on the idler arm and idler pulley, then remove the worn mower belt ([Figure 49](#)).
7. Install the new mower belt around the 2 outside spindle pulleys, the idler pulley, and in the lower groove of the double-spindle pulley ([Figure 49](#)).
8. Connect the idler-arm spring ([Figure 49](#)).
9. Install the PTO-drive belt; refer to [Replacing the PTO-Drive Belt \(page 39\)](#).
10. Adjust the belt guide 3 mm (1/8 inch) from the belt ([Figure 49](#)).
11. Install the belt covers onto the cutting unit and secure the latches.
12. Install the carrier-frame cover onto the cutting unit and secure the latches.

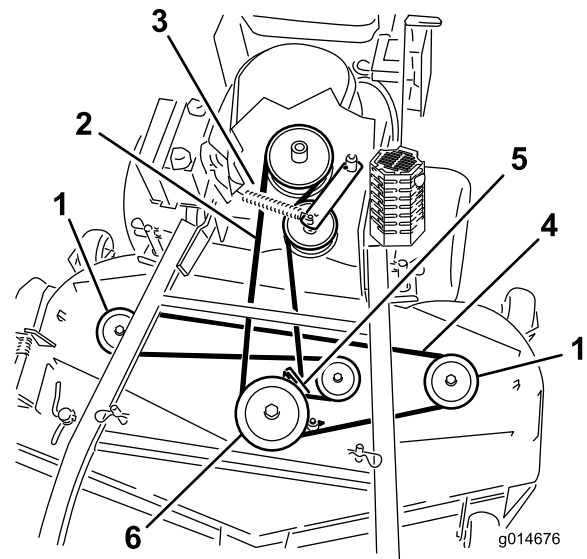


Figure 49

- | | |
|---------------------|--------------------------|
| 1. Outside pulley | 4. Mower-deck belt |
| 2. PTO-drive belt | 5. Belt guide |
| 3. Idler-arm spring | 6. Center spindle pulley |
-

Replacing the PTO-Drive Belt

Service Interval: Every 50 hours

Squealing when the belt is rotating, blades slipping when cutting grass, frayed belt edges, burn marks and cracks are signs of a worn drive belt. Replace the drive belt if any of these conditions are evident.

1. Disengage the PTO and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Unlatch and remove the carrier-frame cover.
4. Unlatch and remove the belt covers.
5. Remove the heat shield from the engine deck and carrier frame.
6. Roll the belt off of the center pulley on the mower deck (Figure 50).

Note: Use caution when removing the belt, as tension will increase because of the spring-loaded idler pulley.

7. Remove the belt from the engine pulley and the spring-loaded idler pulley (Figure 50).
8. Install the new belt onto the engine pulley and the spring-loaded idler pulley (Figure 50).
9. Roll the belt onto the center pulley on the mower deck (Figure 50).
10. Install the heat shield to the engine deck and carrier frame.
11. Adjust the belt guide 3 mm (1/8 inch) from the belt (Figure 50).
12. Install the belt covers onto the cutting unit and secure the latches.
13. Install the carrier frame cover onto the carrier frame and secure the latches.

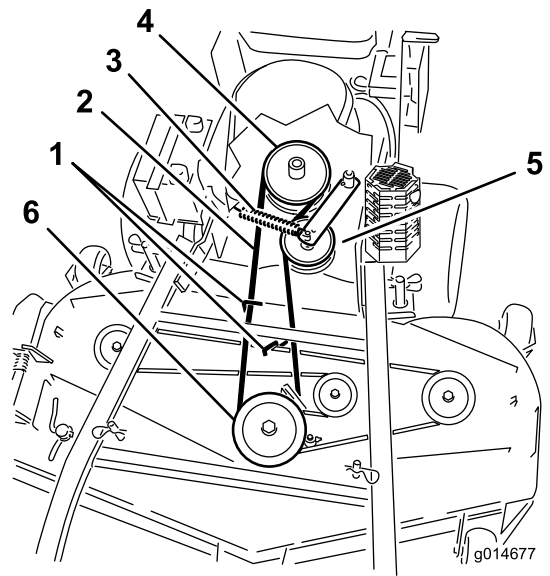


Figure 50

- | | |
|-------------------------|--------------------------------|
| 1. PTO drive belt guide | 4. PTO engagement pulley |
| 2. PTO drive Belt | 5. PTO drive belt idler pulley |
| 3. Idler spring | 6. Center spindle pulley |

Adjusting the PTO-drive Belt Idler-Spring Anchor

The position of the PTO idler can be adjusted to increase or decrease belt tension.

Use [Figure 51](#) for the idler position options.

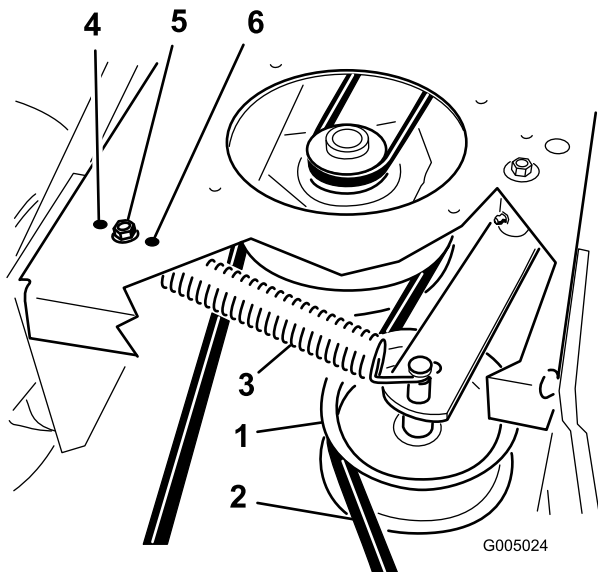


Figure 51

- | | |
|--------------------------------|--|
| 1. PTO-drive belt idler pulley | 4. Maximum tension for worn belts |
| 2. PTO-drive belt | 5. Medium tension for normal belt conditions |
| 3. Idler spring | 6. Least tension for new belts |

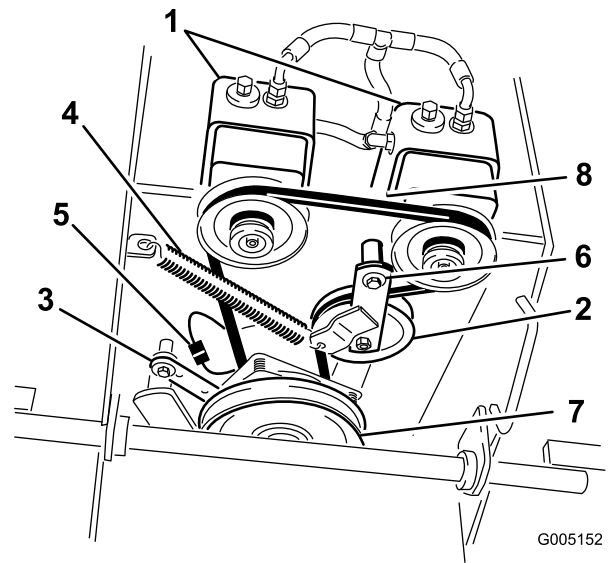


Figure 52

- | | |
|--------------------|--------------------------|
| 1. Hydraulic pumps | 5. Clutch wire connector |
| 2. Idler pulley | 6. Pivot bolt |
| 3. Clutch retainer | 7. Drive pulley |
| 4. Tension spring | 8. Pump-drive belt |

7. Unhook the idler spring from the frame ([Figure 52](#)).
8. Install the new belt around clutch and the 2 drive pulleys.
9. Install the idler spring between the idler arm and the frame bracket ([Figure 52](#)).
10. Install the clutch retainer to the engine deck ([Figure 52](#)).
11. Connect the clutch wire connector to the wire harness.
12. Install the PTO-drive belt.

Replacing the Pump-Drive Belt

Service Interval: Every 50 hours

1. Disengage the PTO and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Remove PTO-drive belt; refer to [Replacing the PTO-Drive Belt](#) (page 39).
4. Raise the machine and support it with jack stands.
5. Disconnect the clutch wire connector from the wire harness.
6. Disconnect the clutch retainer from the engine deck ([Figure 52](#)).

Controls System Maintenance

Adjusting the Motion-Control Handle

Adjusting the Right Motion-Control Lever

If the motion-control levers do not align horizontally, adjust the right motion-control lever.

Note: Adjust the horizontal alignment before the front-to-back alignment.

1. Disengage the PTO, move the right motion-control lever to the neutral position, and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Push the right motion-control lever down out of the Neutral-Lock position (Figure 53).
4. Check if it aligns horizontally with the left motion-control lever (Figure 53).

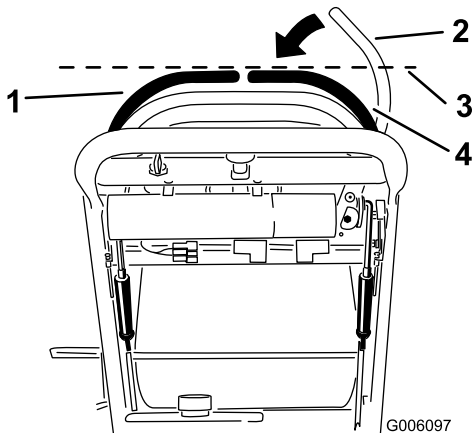
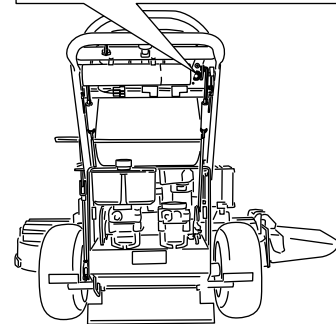
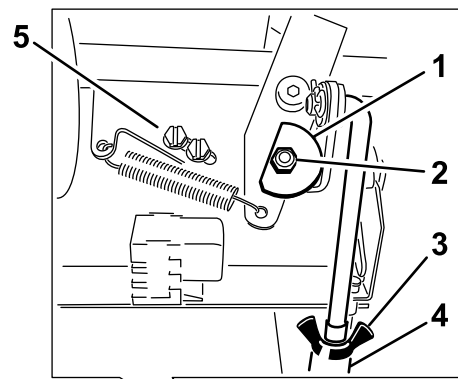


Figure 53

- | | |
|--|--|
| 1. Left motion-control lever | 3. Check the horizontal alignment here |
| 2. Right motion-control lever in the Neutral-Lock position | 4. Right motion-control lever |



G006095

Figure 54

- | | |
|-----------------|------------------|
| 1. Cam | 4. Turnbuckle |
| 2. Nut and bolt | 5. Switch screws |
| 3. Wing nut | |

9. After the cam is adjusted, the lever switch needs to be checked.
10. Check the gap between the control lever and the switch as shown in Figure 55. The gap needs to be between 1.6 to 2.4 mm (1/16 to 3/32 inch).
11. If needed, loosen the screws holding the switch and adjust the switch.
12. Tighten the screws and install the cover under the control panel.

5. To adjust the right motion-control lever horizontally, the cam needs to be adjusted.
6. Remove the cover under the control panel.
7. Loosen the nut and bolt holding the cam (Figure 54).
8. Adjust the cam until it aligns with the left motion-control lever and tighten the nut and bolt for the cam.

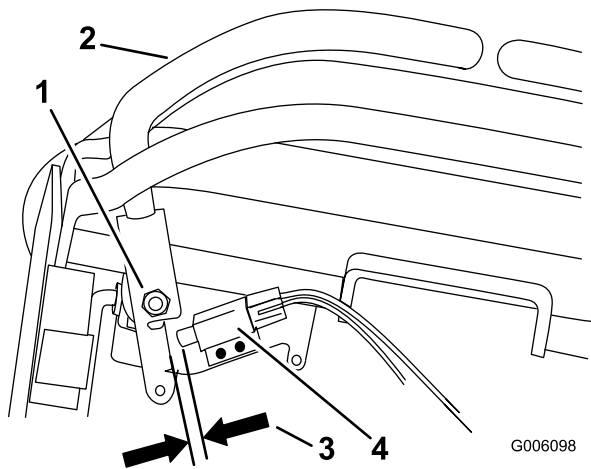


Figure 55

- | | |
|---|--|
| 1. Right side motion-control-lever pivot shown under controls | 3. 1.6 to 2.4 mm (1/16 to 3/32 inch) gap needed between switch and control lever |
| 2. Right side motion-control lever | 4. Switch |

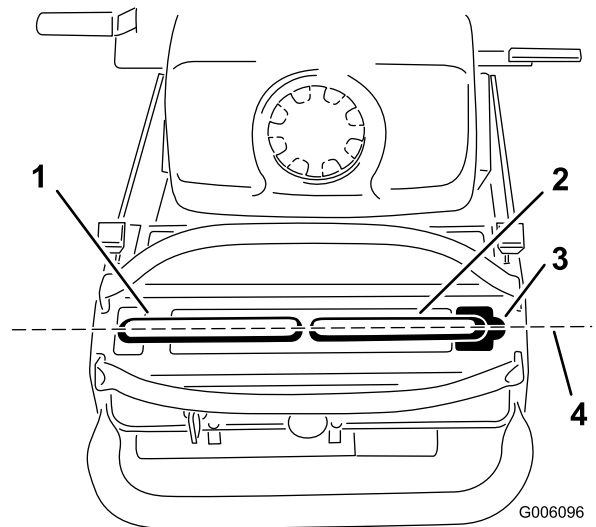


Figure 56

- | | |
|-------------------------------|---|
| 1. Left motion-control lever | 3. Neutral-locked position |
| 2. Right motion-control lever | 4. Align the control levers from front to back here |

Adjusting the Neutral Position for the Motion-Control Levers

Important: Ensure that the tracking of the mower is correct after adjusting the motion-control levers. After adjusting the tracking, the motion-control levers may not align exactly from front to back (Figure 56).

If the motion-control levers do not align front to back, or the right side control lever does not move easily into the neutral-lock position, adjustment is required. Adjust each lever and control rod separately.

Note: Adjust the horizontal alignment before the front-to-back alignment.

1. After the horizontal alignment is finished, check the front-to-back alignment (Figure 56).

2. Loosen the wing nuts on the right control rod and rotate the turnbuckle in or out to ensure that the right side control lever is centered in the neutral-lock position.
3. Secure the turnbuckle into position with the wing nuts (Figure 57).
4. Loosen the wing nuts on the left control rod and rotate the turnbuckle in or out to change the tracking.
5. Secure the turnbuckle in position with the wing nuts (Figure 57).

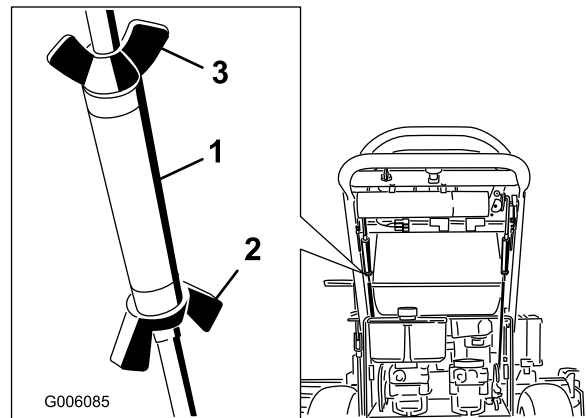


Figure 57

- | | |
|--------------------|--------------------------------------|
| 1. Turnbuckle | 3. Top wing nut (left hand threaded) |
| 2. Bottom wing nut | |

6. Check for proper tracking.
7. Adjust the left control rod if a change is needed; refer to [Adjusting the Tracking \(page 34\)](#).

Hydraulic System Maintenance

Servicing the Hydraulic System

Checking the Hydraulic Fluid

Service Interval: After the first 8 hours
Every 25 hours

Note: There are 2 ways of checking the hydraulic oil. One is when the oil is warm and one is when the oil is cold. The baffle inside the tank has 2 levels depending if the oil is warm or cold.

1. Position machine on a level surface.
2. Disengage the power take off (PTO) and shut off the engine.
3. Wait for all moving parts to stop before leaving the operating position and then set the parking brake.
4. Clean area around cap and filler neck of hydraulic tank (Figure 58).

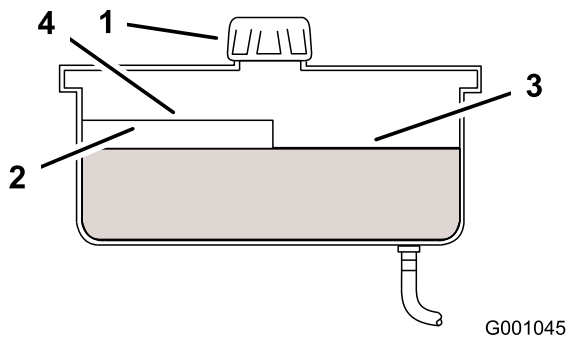


Figure 58

- | | |
|-----------|--------------------------|
| 1. Cap | 3. Cold fluid level—full |
| 2. Baffle | 4. Hot fluid level—full |

5. Remove the cap from the filler neck.
6. Look inside to check the fluid level in the reservoir. (Figure 58).
7. Add fluid to the reservoir until it reaches the cold level of the baffle.
8. Run the machine at low idle for 15 minutes to allow any air to purge out of the system and warm fluid; refer to [Starting and Stopping the Engine](#) (page 16).
9. Check the fluid level while the fluid is warm.

Note: If required, add fluid to the reservoir until it reaches the hot level of the baffle.

Note: The fluid level should be to the top of the hot level of the baffle, when the fluid is warm (Figure 58).

10. Install the cap onto the filler neck.

⚠ WARNING

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

- If hydraulic fluid is injected into the skin it must be surgically removed within a few hours by a doctor familiar with this type of injury. Gangrene may result if this is not done.
- Keep your body and hands away from pin-hole leaks or nozzles that eject high-pressure hydraulic fluid.
- Use cardboard or paper to find hydraulic leaks.
- Safely relieve all pressure in the hydraulic system before performing any work on the hydraulic system.
- Make sure that all hydraulic-fluid hoses and lines are in good condition and all hydraulic connections and fittings are tight before applying pressure to hydraulic system.

Replacing the Hydraulic Filter and Hydraulic Oil

Service Interval: After the first 8 hours

Every 250 hours—Change the hydraulic filter and the hydraulic oil when using Mobil® 1 oil.

Every 500 hours—Change the hydraulic filter and the hydraulic oil when using Toro® HYPR-OIL™ 500 hydraulic oil.

⚠ WARNING

Hot hydraulic fluid can cause severe burns.

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

1. Disengage the PTO and set the parking brake.
2. Stop the engine and wait for all moving parts to stop before leaving the operating position.

Important: Do not substitute an automotive oil filter, or severe hydraulic-system damage may result.

3. Locate the filter under the fuel tank and place a drain pan under the filter (Figure 59).

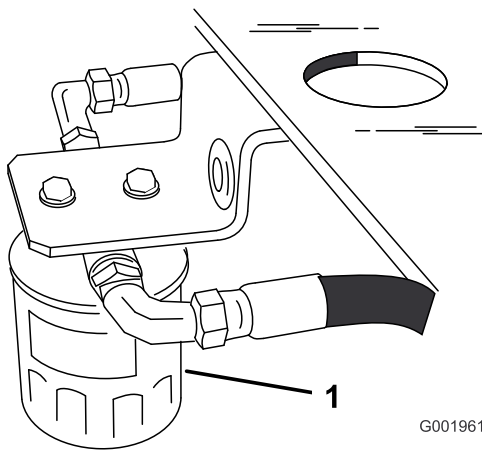


Figure 59

1. Filter

4. Remove the old filter, allow the oil to drain, and wipe the filter-adapter gasket surface clean (Figure 60).
 5. Apply a thin coat of hydraulic fluid to the rubber gasket on the replacement filter.
 6. Install the replacement hydraulic filter onto the filter adapter.
- Note:** Do not tighten the filter onto the adapter.
7. Fill the hydraulic tank with hydraulic fluid until the fluid overflows the filter and then turn the oil filter clockwise until the rubber gasket contacts the filter adapter, then tighten the filter an additional 1/2 turn (Figure 60).

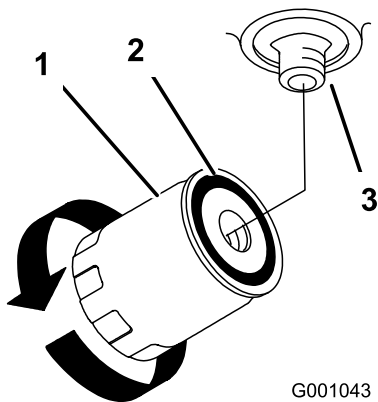


Figure 60

1. Hydraulic filter
2. Gasket
3. Adapter

8. Clean up any spilled fluid.
9. Check the fluid in the reservoir, add fluid to the tank until it reaches the cold baffle of the tank.

Important: Use the oil specified, as other fluids could cause system damage.

10. Start the engine and let it run for about 2 minutes to purge air from the system. Stop the engine and check for leaks. If one or both wheels will not drive, refer to [Bleeding the Hydraulic System](#) (page 44).

11. Check the level and add fluid, if required. **Do not overfill.**

Bleeding the Hydraulic System

The traction system is self bleeding, however, it may be necessary to bleed the system if the fluid is changed or after work is performed on the system.

1. Disengage the PTO and set the parking brake.
2. Stop the engine and wait for all moving parts to stop before leaving the operating position.
3. Raise the rear of the machine up onto jack stands high enough to raise the drive wheels off the ground.
4. Start the engine and move the throttle control to the idle position.

Note: If the drive wheel does not rotate, it is possible to assist the purging of the system by carefully rotating the tire in the forward direction.

5. Check the hydraulic-fluid level as it drops, and add fluid as required to maintain the proper level.
6. Repeat this procedure for the opposite wheel.
7. Thoroughly clean the area around each of the charge-pump housings.

Checking the Hydraulic Lines

Service Interval: Every 100 hours

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

Note: Keep areas around hydraulic system clean from grass and debris buildup.

Mower Deck Maintenance

Servicing the Cutting Blades

To ensure a superior quality of cut, keep the blades sharp. For convenient sharpening and replacement, you may want to keep extra blades on hand.

⚠ WARNING

A worn or damaged blade can break, and a piece of the blade could be thrown into the operator's or bystander's area, resulting in serious personal injury or death.

- Inspect the blades periodically for wear or damage.
- Replace a worn or damaged blade.

Before Inspecting or Servicing the Blades

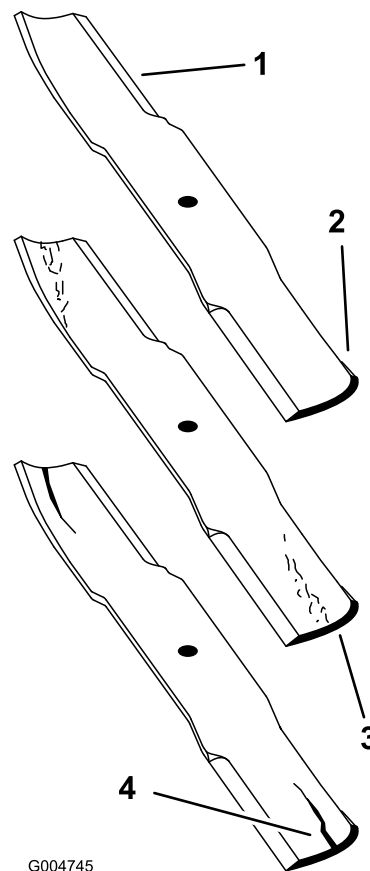
Park the machine on a level surface, disengage the blades and set the parking brake. Turn the ignition key to off. Remove the key and disconnect the spark plug wires from the spark plugs.

Inspecting the Blades

Service Interval: Before each use or daily

1. Inspect the cutting edges (Figure 61).

Note: If the edges are not sharp or have nicks, remove and sharpen the blades; refer to [Sharpening the Blades](#) (page 47).



G004745

Figure 61

- | | |
|-----------------|---|
| 1. Cutting edge | 3. Wear/slot forming in the curved area |
| 2. Sail | 4. Crack in the curved area |

2. Inspect the blades, especially the curved area (Figure 61).

Note: If you notice any cracks, wear, or a slot forming in this area (Figure 61), immediately install a new blade.

Checking for Bent Blades

1. Disengage the PTO, move the motion-control levers to the neutral-locked position, and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Rotate the blades until the ends face forward and backward. Measure from a level surface to the cutting edge, position **A**, of the blades (Figure 62).

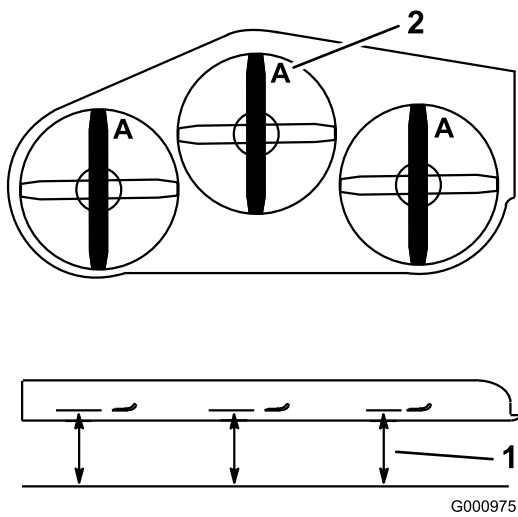


Figure 62

1. Measure here from blade to hard surface
2. Position A

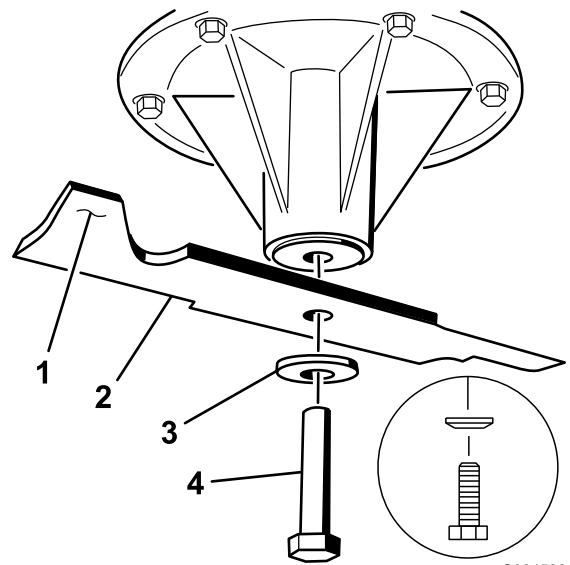


Figure 63
48-inch mower decks

1. Sail area of the blade
2. Blade
3. Curved washer
4. Blade bolt

4. Rotate the opposite ends of the blades forward.
5. Measure from a level surface to the cutting edge of the blades at the same position as in step 3 above. The difference between the dimensions obtained in steps 3 and 4 must not exceed 3 mm (1/8 inch). If this dimension exceeds 3 mm (1/8 inch), the blade is bent and must be replaced; refer to [Removing the Blades](#) (page 46) and [Installing the Blades](#) (page 47).

⚠ WARNING

A blade that is bent or damaged could break apart and could seriously injure or kill you or bystanders.

- Always replace bent or damaged blade with a new blade.
- Never file or create sharp notches in the edges or surfaces of blade.

Removing the Blades

Blades must be replaced if a solid object is hit, if the blade is out of balance or is bent. To ensure optimum performance and continued safety conformance of the machine, use genuine Toro replacement blades. Replacement blades made by other manufacturers may result in non-conformance with safety standards.

1. Hold the blade end using a rag or thickly-padded glove.
2. For 48-inch mower decks, remove the blade bolt, curved washer, and blade from the spindle shaft ([Figure 63](#)).

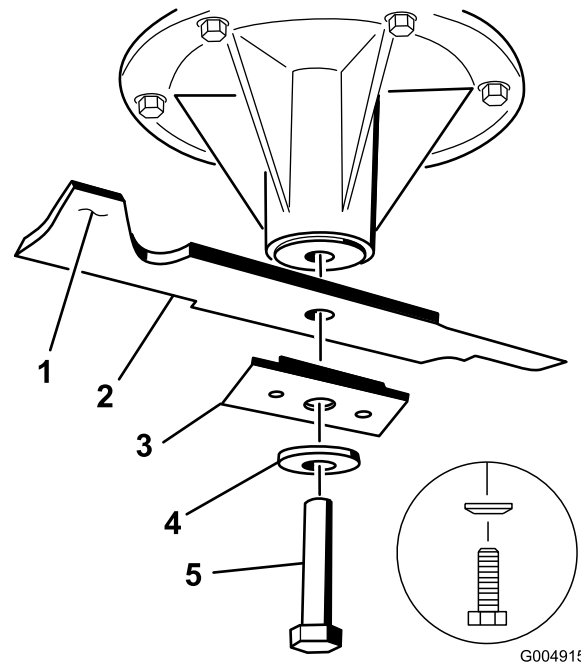


Figure 64
52-inch mower decks

1. Sail area of the blade
2. Blade
3. Blade stiffener
4. Curved washer
5. Blade bolt

Sharpening the Blades

1. Use a file to sharpen the cutting edge at both ends of the blade ([Figure 65](#)). Maintain the original angle. The blade retains its balance if the same amount of material is removed from both cutting edges.

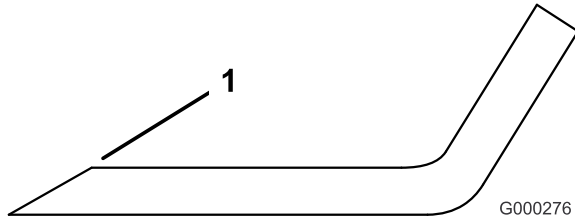


Figure 65

1. Sharpen at the original angle

-
2. Check the balance of the blade by putting it on a blade balancer ([Figure 66](#)).

Note: If the blade stays in a horizontal position, the blade is balanced and can be used. If the blade is not balanced, file some metal off the end of the sail area only ([Figure 63](#)).

3. Repeat this procedure until the blade is balanced.

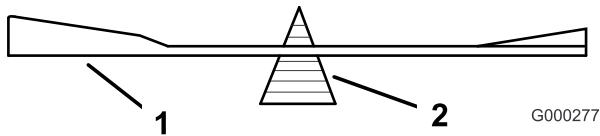


Figure 66

1. Blade
2. Balancer

Installing the Blades

1. Install the blade onto the spindle shaft ([Figure 63](#)).

Important: The sail part of the blade must be pointing upward, toward the inside of the mower to ensure proper cutting ([Figure 63](#)).

2. For 48-inch mower decks, install the blade, curved washer, and the blade bolt ([Figure 63](#)).
3. For 52-inch mower decks, install the blade, stiffener, curved washer, and the bolt ([Figure 64](#)).
4. Torque the blade bolt to 115 to 140 N-m (85 to 110 ft-lb).

Correcting the Mower Quality of Cut

If one deck blade cuts lower than the other, correct as follows.

Note: Tire air pressure is critical in these procedures. Make sure all tires have the correct pressure.

1. Disengage the PTO and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Disconnect the spark plug wire(s) from the spark plug(s).
4. Adjust the tire pressure in the rear tires to specifications.
5. Check that the blades and spindle shafts are not bent; refer to [Checking for Bent Blades \(page 45\)](#).
6. Set the height-of-cut to the 101.6 mm (4 inches) position; refer to [Adjusting the Height-of-Cut \(page 20\)](#).
7. Perform the steps in [Setting up the Frame \(page 48\)](#).

Setting up the Frame

Checking the Carrier Frame and the Engine-Deck Alignment

Note: Misalignment can cause excess wear on the PTO-drive belt.

1. Disengage the PTO and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Place a long straight edge on top of the engine deck as shown in [Figure 67](#).
4. At the carrier frame cross channel, measure the height at location **A** ([Figure 67](#)). This measurement must be 33 mm (1-5/16 inches), plus or minus 6 mm (1/4 inch).
5. If the height at location **A** is not correct, adjustment is needed.
6. Loosen the carrier frame mounting bolts on both sides of the machine ([Figure 67](#)).
7. Align the carrier frame and engine deck to match 33 mm (1-5/16 inches), plus or minus 6 mm (1/4 inch) at location **A** ([Figure 67](#)).
8. Tighten the carrier frame mounting bolts on both sides of the machine.

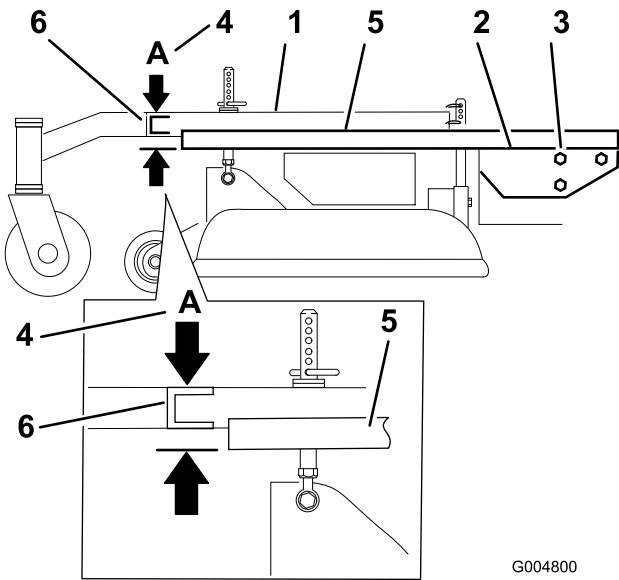


Figure 67

- | | |
|---------------------------------|--|
| 1. Carrier frame | 4. Location A—33 mm (1-5/16 inches) ±6 mm (1/4 inch) |
| 2. Top of the engine deck | 5. Straight edge |
| 3. Carrier frame mounting bolts | 6. Carrier frame cross channel |

Checking the Engine-Deck Height

1. Disengage the PTO and set the parking brake.

2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Adjust the tire pressure in the rear tires to specifications; refer to [Checking the Tire Pressure](#) (page 34).
4. Measure engine-deck height at location **A** ([Figure 68](#)).
5. Measure engine-deck height at location **B** ([Figure 68](#)).
6. If the height at location **A** and **B** are not the same, change tire pressure slightly to make them the same.

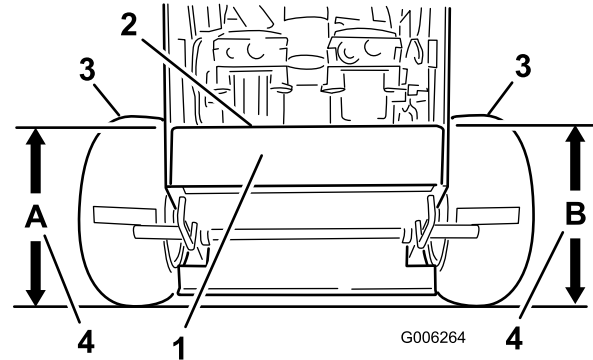


Figure 68

- | | |
|-----------------------------|-------------------------------------|
| 1. Back view of the machine | 3. Tires |
| 2. Top of the engine deck | 4. Same height at locations A and B |

Checking the Carrier Frame Front-to-Rear Pitch

The carrier frame must have a pitch between 3 mm (1/8 inch) to 9 mm (3/8 inch) over the length of 61 cm (24 inches) on the carrier frame ([Figure 69](#)).

1. Measure out 61 cm (24 inches) on the carrier frame ([Figure 69](#)).

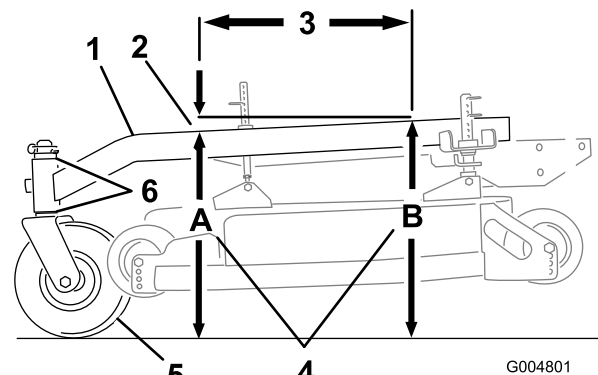


Figure 69

- | | |
|--|--------------------------------|
| 1. Carrier frame | 4. Height at locations A and B |
| 2. 3 to 10 mm (1/8 inch to 3/8 inch) pitch over 61 cm (24 inches) length | 5. Caster wheel |
| 3. 61 cm (24 inches) | 6. Caster spacers |

2. Measure carrier-frame height at location **A** ([Figure 69](#)).

3. Measure carrier-frame height at location **B** (Figure 69).
4. The height at location **A** must be 3 to 10 mm (1/8 inch to 3/8 inch) lower than location **B** (Figure 69).
5. If the carrier frame is not correct, move caster spacers to make it an 3 to 10 mm (1/8 inch to 3/8 inch) pitch (Figure 69).
6. Move spacers from the top or bottom to make the correct pitch.
7. The tire pressure may also be adjusted slightly to make an 3 to 10 mm (1/8 inch to 3/8 inch) pitch.

Checking the Carrier Frame Side-to-Side Height

The carrier frame needs to be parallel side-to-side from the ground.

1. Disengage the PTO and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Adjust the tire pressure in the rear tires to specifications; refer to [Checking the Tire Pressure \(page 34\)](#).
4. Measure carrier-frame height at location **A** (Figure 70).
5. Measure carrier-frame height at location **B** (Figure 70).
6. If the carrier-frame height is not the same move spacers from the top or bottom of caster wheel, to make it level. The tire pressure may also be adjusted slightly to make it level.

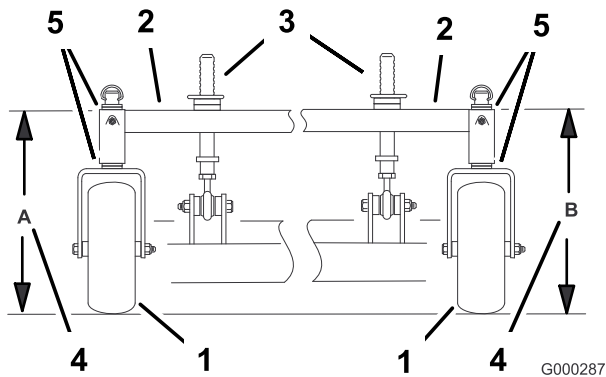


Figure 70

- | | |
|-----------------------------|-------------------------------------|
| 1. Caster wheel | 4. Same height at locations A and B |
| 2. Carrier frame | 5. Caster spacers |
| 3. Front height-of-cut pins | |

Checking the Mower Deck Front-to-Rear Pitch

1. Adjust the tire pressure in the rear tires to specifications; refer to [Checking the Tire Pressure \(page 34\)](#).
2. Position one blade front-to-rear. Measure at **A** and **B** locations from a level surface to the cutting edge of the blade tips (Figure 71).
3. The mower blade should be a 6 mm (1/4 inch) lower in the front at **A** than in the rear at **B**.
4. Rotate blades and repeat for other blades. If it is not correct, proceed to [Changing the Mower Deck Front-to-Rear Pitch \(page 50\)](#).

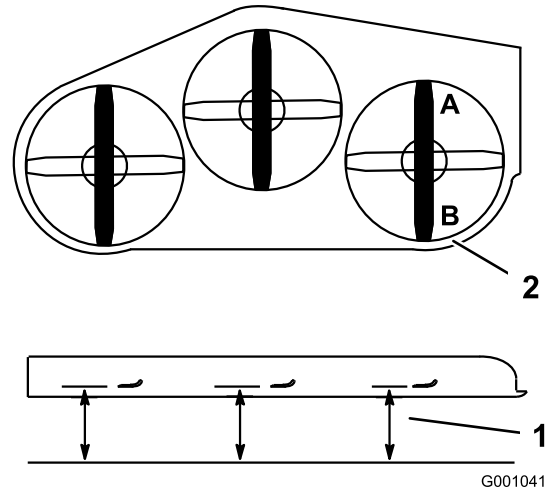


Figure 71

1. Measure blade at points **A** and **B**
2. Measure from a level surface

Changing the Mower Deck Front-to-Rear Pitch

Changing the front-to-rear pitch is done by adjusting the front height-of-cut posts.

1. To change the front-to-rear pitch, the front height-of-cut posts can be adjusted (Figure 72).

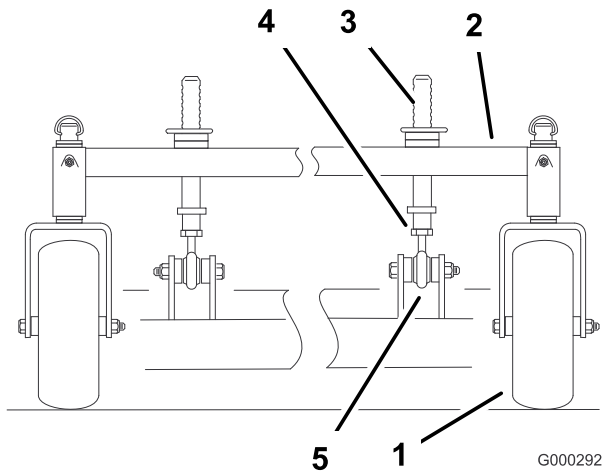


Figure 72

- | | |
|-----------------------------|---------------|
| 1. Caster wheel | 4. Jam nut |
| 2. Carrier frame | 5. Ball joint |
| 3. Front height-of-cut pins | |

2. To raise the front of the deck, loosen the jam nut and rotate the front pin clockwise (Figure 72).
3. To lower the front of the deck, loosen the jam nut and rotate the front pin counterclockwise (Figure 72).
4. Position the blades front-to-rear.
5. Measure at the C and D locations (Figure 71) from a level surface to the cutting edge of the blades.
6. Check the side-to-side leveling of the cutting unit.
7. Tighten the jam nuts (Figure 72).

Checking the Mower Deck Side-to-Side Height

1. Adjust the rear tire pressure to specifications; refer to [Checking the Tire Pressure \(page 34\)](#).
2. Position the blades side-to-side.
3. Measure at C and D locations from a level surface to the cutting edge of blade tips (Figure 73).

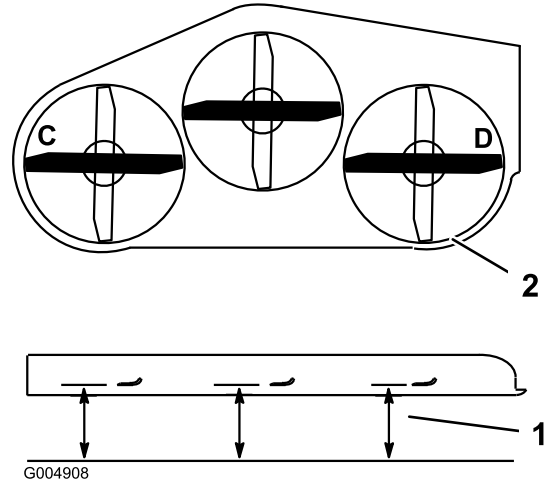


Figure 73

- | | |
|---------------------------------|------------------------------------|
| 1. Measure from a level surface | 2. Measure blade at points C and D |
|---------------------------------|------------------------------------|

4. The difference between measurements C and D should be no more than 6 mm (1/4 inch).

Changing the Mower Deck Side-to-Side Height

Changing the side-to-side height is done by adjusting the rear tire pressure and the caster spacers.

1. Change the rear tire pressure. Do this to the corresponding side that needs adjustment.
2. Adjust the caster spacer.
3. Check the front-to-rear pitch and side-to-side leveling of the cutting unit.

Matching the Height of Cut

1. Check the rear tire pressure; refer to [Checking the Tire Pressure](#) (page 34).
2. Set the height-of-cut to the 101.6 mm (4 inches) position following the height-of-cut decal.
3. With the machine on level surface, position one blade front-to-rear. Measure at **A** and from level surface to the cutting edge of the blade tips ([Figure 74](#)).

Note: The measurement should be 101.6 mm (4 inches).

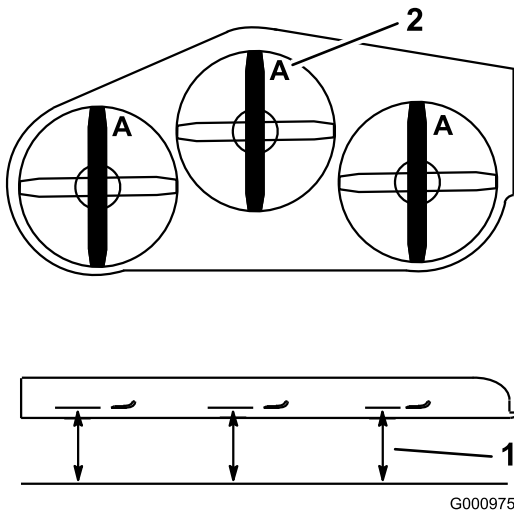


Figure 74

1. Measure from a level surface
 2. Measure blade at point **A**
-
4. If it does not measure correctly:
 - A. Adjust the rear tire pressure.
 - B. Adjust the caster-fork spacers.
 - C. Adjust the front mower deck support pins.
 5. Check the carrier frame front-to-rear pitch.

Replacing the Grass Deflector

⚠ WARNING

An uncovered discharge opening could allow the lawn mower to throw objects in the operator's or bystander's direction and result in serious injury. Also, contact with the blade could occur.

Never operate the lawn mower unless you install a cover plate, a mulch plate, grass deflector or bagger.

1. Remove the locknut, bolt, spring, and spacer holding the deflector to the pivot brackets ([Figure 75](#)).
2. Remove the damaged or worn grass deflector.

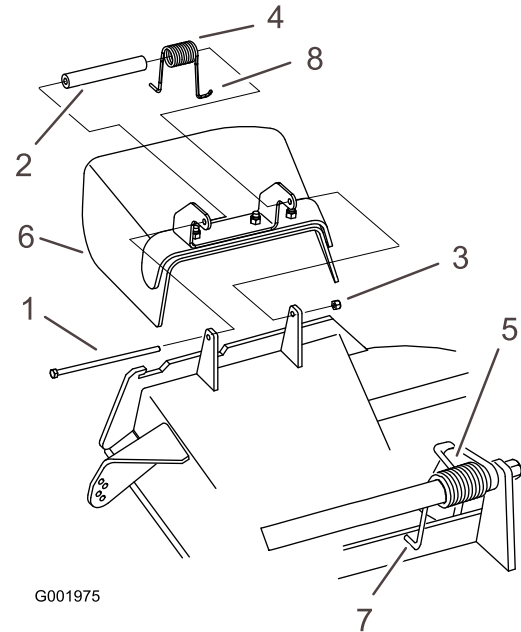


Figure 75

- | | |
|------------|-------------------------|
| 1. Bolt | 5. Spring installed |
| 2. Spacer | 6. Grass Deflector |
| 3. Locknut | 7. J-hook end of spring |
| 4. Spring | |

3. Place the spacer and spring onto the grass deflector. Place one **J** end of the spring behind the deck edge.

Note: Make sure one **J** end of the spring is installed behind the deck edge before installing the bolt as shown in [Figure 75](#).

4. Install the bolt and nut. Place one **J**-hook end of the spring around the grass deflector ([Figure 75](#)).

Important: The grass deflector must be able to rotate. Lift the deflector up to the full, open position and ensure that it rotates into the full, down position.

Cleaning

Cleaning under the Mower

Service Interval: Before each use or daily

Remove the grass buildup under the mower daily.

1. Disengage the PTO, move the motion-control levers to the neutral-locked position, and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Raise the front of the machine and use jack stands to support the mower.

Disposing of Waste

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

Storage

Cleaning and Storing the Machine

1. Disengage the power take off (PTO), set the parking brake, turn the ignition key to off, and remove the key.
2. Remove grass clippings, dirt, and grime from the external parts of the entire machine, especially the engine. Clean the dirt and chaff from the outside of the engine's cylinder-head fins and the blower housing.

Important: You can wash the machine with mild detergent and water. Do not pressure wash the machine. Avoid excessive use of water, especially near the drive system and engine. Pressure washing can force dirt and water into critical parts, such as spindle bearings and electrical switches.

3. Check the brake; refer to [Servicing the Brake \(page 37\)](#).
4. Service the air cleaner; refer to [Servicing the Air Cleaner \(page 26\)](#).
5. Grease the machine; refer to [Lubrication \(page 25\)](#).
6. Change the engine oil; refer to [Changing the Engine Oil \(page 27\)](#).
7. Check the tire pressure; refer to [Checking the Tire Pressure \(page 34\)](#).
8. For long-term storage:
 - A. Add stabilizer/conditioner additive to fuel in the tank.
 - B. Run engine to distribute conditioned fuel through the fuel system (5 minutes).
 - C. Stop engine, allow to cool and drain the fuel tank; refer to [Draining the Fuel Tank \(page 29\)](#), or operate engine until it stops.
 - D. Restart engine and run until it stops. Repeat, on Choke until engine will not restart.
 - E. Dispose of fuel properly. Recycle as per local codes.

Note: Do not store stabilizer/conditioned gasoline over 90 days.
9. Remove the spark plug(s) and check its condition; refer to [Servicing the Spark Plugs \(page 28\)](#). With the spark plug(s) removed from the engine, pour two tablespoons of engine oil into the spark plug hole. Now use the starter to crank the engine and distribute the oil inside the cylinder. Install the spark plug(s). Do not install the wire on the spark plug(s).
10. Check and tighten all bolts, nuts, and screws. Repair or replace any part that is damaged or defective.
11. Paint all scratched or bare metal surfaces. Paint is available from your Authorized Service Dealer.

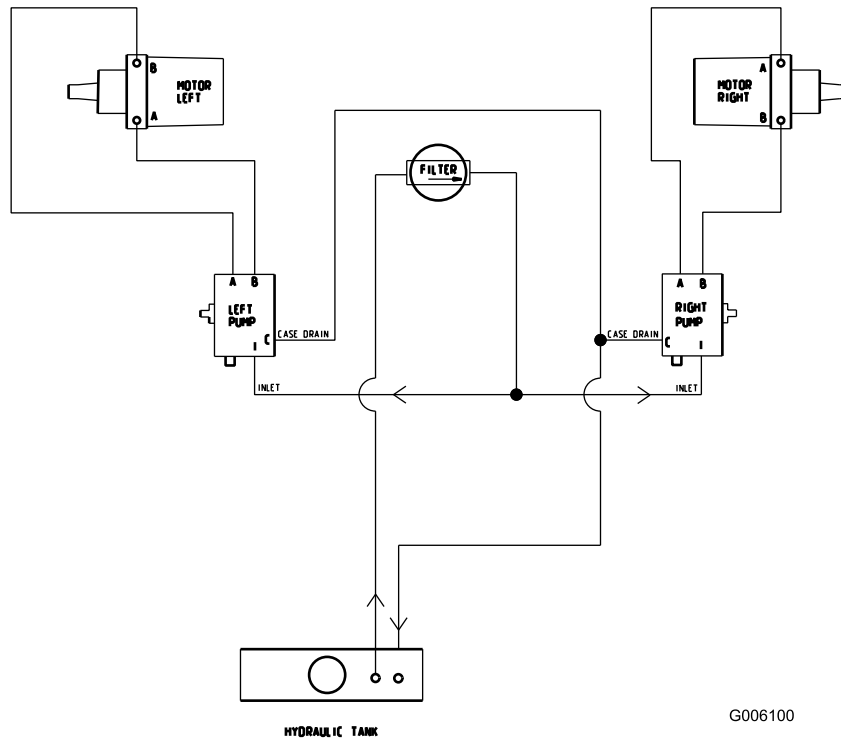
12. Store the machine in a clean, dry garage or storage area. Remove the key from the ignition switch and keep it in a memorable place. Cover the machine to protect it and keep it clean.

Troubleshooting

Problem	Possible Cause	Corrective Action
The engine will not start, starts hard, or fails to keep running.	<ol style="list-style-type: none"> 1. Fuel tank is empty. 2. Choke is not on. 3. Air cleaner is dirty. 4. Spark-plug wire is loose or disconnected. 5. Spark plug is pitted, fouled, or the gap is incorrect. 6. Dirt in the fuel filter. 7. Dirt, water, or stale fuel is in the fuel system. 8. The gap between the neutral switch bolt and the switch is not correct. 	<ol style="list-style-type: none"> 1. Fill the fuel tank with gasoline. 2. Move the choke lever to choke position. 3. Service the air-cleaner element. 4. Install the wire on the spark plug. 5. Install a new, correctly gapped spark plug. 6. Replace the fuel filter. 7. Contact an Authorized Service Dealer. 8. Contact an Authorized Service Dealer.
The engine loses power.	<ol style="list-style-type: none"> 1. Engine load is excessive. 2. Air cleaner is dirty. 3. Oil level in the crankcase is low. 4. Cooling fins and air passages under the engine blower housing are plugged. 5. Spark plug is pitted, fouled, or the gap is incorrect. 6. Vent hole in the fuel cap is plugged. 7. Dirt in the fuel filter. 8. Dirt, water, or stale fuel is in the fuel system. 	<ol style="list-style-type: none"> 1. Reduce the ground speed. 2. Service the air cleaner. 3. Add oil to the crankcase. 4. Remove the obstruction from the cooling fins and air passages. 5. Install a new, correctly gapped spark plug. 6. Clean or replace the fuel cap. 7. Replace the fuel filter. 8. Contact an Authorized Service Dealer.
The engine overheats.	<ol style="list-style-type: none"> 1. Engine load is excessive. 2. Oil level in the crankcase is low. 3. Cooling fins and air passages under the engine blower housing are plugged. 	<ol style="list-style-type: none"> 1. Reduce the ground speed. 2. Add oil to the crankcase. 3. Remove the obstruction from the cooling fins and air passages.
The machine does not drive.	<ol style="list-style-type: none"> 1. Hydraulic oil reservoir low. 2. Air in the hydraulic system. 3. Pump drive belt slipping. 4. Pump drive belt idler spring missing. 	<ol style="list-style-type: none"> 1. Add hydraulic oil to the reservoir. 2. Bleed the air out the hydraulic system. 3. Replace the pump drive belt. 4. Replace the pump drive belt idler spring.
There is an abnormal vibration.	<ol style="list-style-type: none"> 1. Cutting blade(s) is/are bent or unbalanced. 2. Blade mounting bolt is loose. 3. Engine mounting bolts are loose. 4. Loose engine pulley, idler pulley, or blade pulley. 5. Engine pulley is damaged. 6. Blade spindle is bent. 	<ol style="list-style-type: none"> 1. Install new cutting blade(s). 2. Tighten the blade mounting bolt. 3. Tighten the engine mounting bolts. 4. Tighten the appropriate pulley. 5. Contact an Authorized Service Dealer. 6. Contact an Authorized Service Dealer.
The cutting height is uneven.	<ol style="list-style-type: none"> 1. Blade(s) not sharp. 2. Cutting blade(s) is/are bent. 3. Mower is not level. 4. Mower pitch is wrong. 5. Underside of mower is dirty. 6. Tire pressure is not correct. 7. Blade spindle bent. 	<ol style="list-style-type: none"> 1. Sharpen the blade(s). 2. Install new cutting blade(s). 3. Level the mower side-to-side position. 4. Adjust the front-to-rear pitch. 5. Clean the underside of the mower. 6. Adjust the tire pressure. 7. Contact an Authorized Service Dealer.

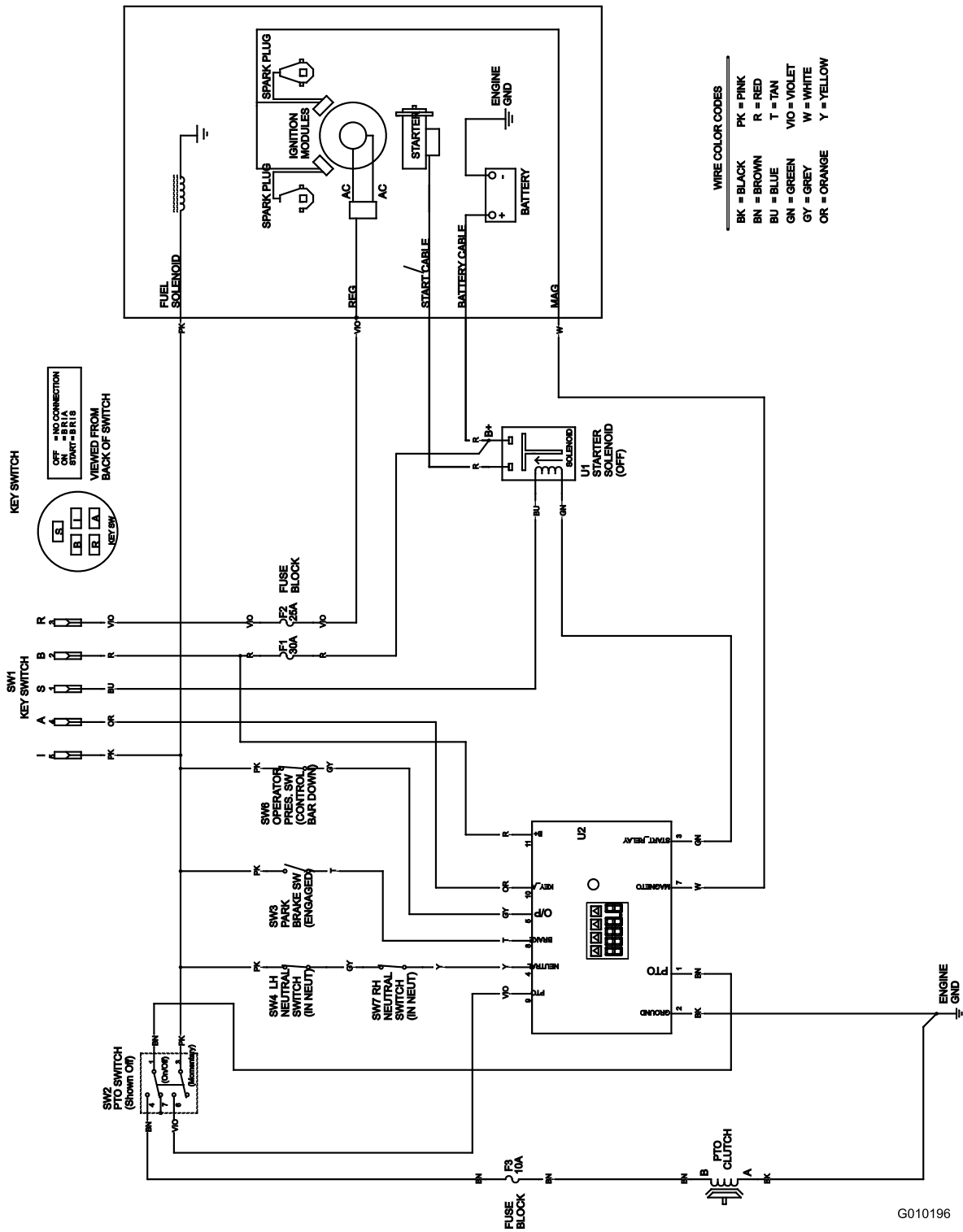
Problem	Possible Cause	Corrective Action
The blades do not rotate.	<ol style="list-style-type: none"> 1. Drive belt is worn, loose or broken. 2. Drive belt is off pulley. 3. Deck belt is worn, loose or broken. 4. Deck belt is off pulley. 5. Broken or missing idler spring. 6. Electric clutch out of adjustment. 7. Clutch connector or wire damaged. 8. Damaged electric clutch. 9. Safety interlock system prevents blade rotation. 10. PTO switch is faulty. 	<ol style="list-style-type: none"> 1. Check the belt tension. 2. Install drive belt and check adjusting shafts and belt guides for correct position. 3. Install new deck belt. 4. Install deck pulley and check the idler pulley, idler arm and spring for correct position and function. 5. Replace the spring. 6. Adjust the clutch air gap. 7. Contact an Authorized Service Dealer. 8. Contact an Authorized Service Dealer. 9. Contact an Authorized Service Dealer. 10. Contact an Authorized Service Dealer.

Schematics



G006100

Hydraulic Schematic (Rev. A)



Electrical Schematic (Rev. A)

G010196

Notes:

Notes:



The Toro Total Coverage Warranty

A Limited Warranty (see warranty periods below)

Landscape
Contractor
Equipment
(LCE)

Conditions and Products Covered

The Toro Company and its affiliate, Toro Warranty Company, pursuant to an agreement between them, jointly promise to the original purchaser to repair the Toro Products listed below if defective in materials or workmanship.

The following time periods apply from the date of purchase by the original owner:

Products	Warranty Period
21 in. Mowers	2 years Residential Use ¹ 1 year Commercial Use
• Engines ⁴	Honda – 2 years Kawasaki – 3 years
30 in. Mowers	2 years Residential Use ¹ 1 year Commercial Use
• Engines ⁴	Kawasaki – 3 years
Mid-Size Walk-Behind Mowers	2 years
• Engines ⁴	Kawasaki – 3 years
Grand Stand® Mowers	5 years or 1,200 hours ² 3 years
• Engines ⁴	Lifetime (original owner only) ³
• Frame	
Z Master® 2000 Series Mowers	4 years or 500 hours ² 3 years
• Engines ⁴	Lifetime (original owner only) ³
• Frame	
Z Master® 3000 Series Mowers	5 years or 1,200 hours ² 3 years
• Engines ⁴	Lifetime (original owner only) ³
• Frame	
Z Master® 5000 Series Mowers	5 years or 1,200 hours ² Kohler Command – 2 years Kohler EFI – 3 years
• Engines ⁴	Lifetime (original owner only) ³
• Frame	
Z Master® 6000 Series Mowers	5 years or 1,200 hours ² Kawasaki – 3 years
• Engines ⁴	Lifetime (original owner only) ³
• Frame	
Z Master® 7000 Series Mowers	5 years or 1,200 hours ² 2 years
• Engines ⁴	Lifetime (original owner only) ³
• Frame	
All Mowers	
• Battery	90 days Parts and Labor 1 year Parts only
• Belts and Tires	90 days
• Attachments	1 year

¹Residential use means use of the product on the same lot as your home. Use at more than one location is considered commercial use and the commercial warranty would apply.

²Whichever occurs first.

³Lifetime Frame Warranty - If the main frame, consisting of the parts welded together to form the tractor structure that other components such as the engine are secured to, cracks or breaks in normal use, it will be repaired or replaced, at Toro's option, under warranty at no cost for parts and labor. Frame failure due to misuse or abuse and failure or repair required due to rust or corrosion are not covered.

⁴Some engines used on Toro Products are warranted by the engine manufacturer.

Instructions for Obtaining Warranty Service

If you think that your Toro Product contains a defect in materials or workmanship, follow this procedure:

1. Contact any Authorized Toro Service Dealer to arrange service at their dealership. To locate a dealer convenient to you, refer to the Yellow Pages of your telephone directory (look under "Lawn Mowers") or access our web site at www.Toro.com. You may also call the numbers listed in item #3 to use the 24-hour Toro Dealer locator system.
2. Bring the product and your proof of purchase (sales receipt) to the Service Dealer. The dealer will diagnose the problem and determine if it is covered under warranty.
3. If for any reason you are dissatisfied with the Service Dealer's analysis or with the assistance provided, contact us at:

RLC Customer Care Department
Toro Warranty Company
8111 Lyndale Avenue South
Bloomington, MN 55420-1196
888-865-5676 (U.S. Customers)
888-865-5691 (Canada customers)

Owner Responsibilities

You must maintain your Toro Product by following the maintenance procedures described in the *Operator's Manual*. Such routine maintenance, whether performed by a dealer or by you, is at your expense.

Items and Conditions Not Covered

There is no other express warranty except for special emission system coverage and engine warranty coverage on some products. This express warranty does not cover the following:

- Cost of regular maintenance service or parts, such as filters, fuel, lubricants, oil changes, spark plugs, air filters blade sharpening or worn blades, cable/linkage adjustments, or brake and clutch adjustments
- Components failing due to normal wear
- Any product or part which has been altered or misused or neglected and requires replacement or repair due to accidents or lack of proper maintenance
- Pickup and delivery charges
- Repairs or attempted repairs by anyone other than an Authorized Toro Service Dealer
- Repairs necessary due to failure to follow recommended fuel procedure (consult *Operator's Manual* for more details)
 - Removing contaminants from the fuel system is not covered
 - Use of old fuel (more than one month old) or fuel which contains more than 10% ethanol or more than 15% MTBE
 - Failure to drain the fuel system prior to any period of non-use over one month

General Conditions

All repairs covered by these warranties must be performed by an Authorized Toro Service Dealer using Toro approved replacement parts.

Neither The Toro Company nor Toro Warranty Company is liable for indirect, incidental or consequential damages in connection with the use of the Toro Products covered by this warranty, including any cost or expense of providing substitute equipment or service during reasonable periods of malfunction or non-use pending completion of repairs under this warranty.

All implied warranties of merchantability (that the product is fit for ordinary use) and fitness for use (that the product is fit for a particular purpose) are limited to the duration of the 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.

Countries Other than the United States or Canada

Customers who have purchased Toro products outside the United States or Canada should contact their Toro Distributor (Dealer) to obtain guarantee policies for your country, province, or state. If for any reason you are dissatisfied with your Distributor's service or have difficulty obtaining guarantee information, contact the Toro importer. If all other remedies fail, you may contact us at Toro Warranty Company.

Australian Consumer Law: Australian customers will find details relating to the Australian Consumer Law either inside the box or at your local Toro Dealer. 374-0252 Rev F