



Count on it.

Operator's Manual

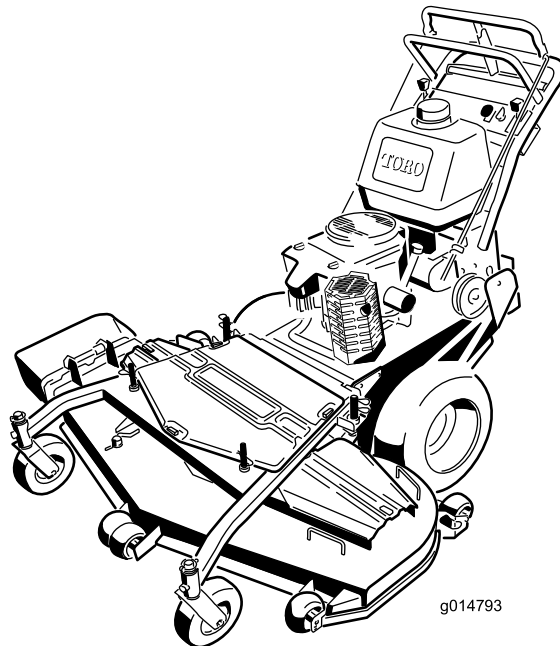
**Commercial Walk-Behind Mower
Floating Deck, T-Bar, Gear Drive with 36in or
48in TURBO FORCE® Cutting Unit**

Model No. 30074—Serial No. 31400001 and Up

Model No. 30078—Serial No. 31400001 and Up

Model No. 39074—Serial No. 31400001 and Up

Model No. 39078—Serial No. 31400001 and Up



g014793



⚠ WARNING

CALIFORNIA Proposition 65 Warning

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

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

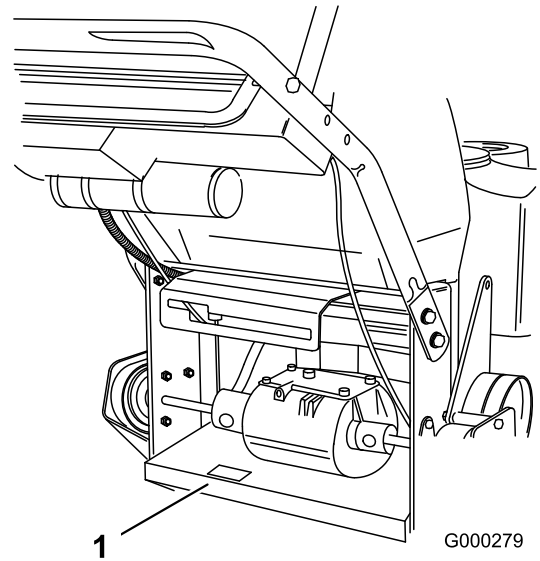


Figure 1

1. Model and serial number location

This spark ignition system complies with Canadian ICES-002.

Important: This engine is not equipped with a spark arrester muffler. It is a violation of California Public Resource Code Section 4442 to use or operate the engine on any forest-covered, brush-covered, or grass-covered land. Other states or federal areas may have similar laws.

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

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.

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.



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.

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Safety

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

Improper use or maintenance by the operator or owner can result in injury. To reduce the potential for injury, comply with these safety instructions and always pay attention to the safety alert symbol **▲**, which means CAUTION, WARNING, or DANGER—"personal safety instruction." Failure to comply with the instruction may result in personal injury or death.

Safe Operating Practices

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

Training

- Read the Operator's Manual and other training material. If the operator(s) or mechanic(s) can not read English 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 himself or herself, other people or property.

Preparation

- Evaluate the terrain to determine what accessories and attachments are needed to properly and safely perform the job. Only use accessories and attachments approved by the manufacturer.
- Wear appropriate clothing including 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 to be used and remove all objects such as rocks, toys and wire which 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.

- Never run an engine in an enclosed area.
- Only operate in good light, keeping away from holes and hidden hazards.
- Be sure all drives are in neutral and parking brake is engaged before starting engine. Only start engine from the operator's position.
- Be sure of your footing while using this machine, especially when backing up. Walk, don't run. Never operate on wet grass. 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 machine's stability. Use caution while operating near drop-offs.
- Slow down and use caution when making turns and when changing directions on slopes.
- Never raise deck with the blades running.
- Never operate with the PTO shield, or other guards not securely in place. Be sure all interlocks are attached, adjusted properly, and functioning properly.
- Never 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 parking brake (if provided), shut off engine before leaving the operator's position for any reason including emptying the catchers or unclogging the chute.
- Stop equipment and inspect blades after striking objects or if an abnormal vibration occurs. Make necessary repairs before resuming operations.
- Keep hands and feet away from the cutting unit.
- Look behind and down before backing up to be sure of a clear path.
- Keep pets and bystanders away.
- Slow down and use caution when making turns and crossing roads and sidewalks. Stop blades if 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.
- 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.

Safe Handling of Fuels

- To avoid personal injury or property damage, use extreme care in handling gasoline. Gasoline is extremely flammable and the vapors are explosive.

- Extinguish all cigarettes, cigars, pipes, and other sources of ignition.
- Use only an approved fuel container.
- Never remove fuel cap or add fuel with the engine running.
- Allow engine to cool before refueling.
- Never refuel the machine indoors.
- Never store the machine or fuel container where there is an open flame, spark, or pilot light such as on a water heater or on other appliances.
- Never fill containers inside a vehicle or on a truck or trailer bed with a plastic liner. Always place containers on the ground away from your vehicle before filling.
- Remove equipment from the truck or trailer and refuel it on the ground. If this is not possible, then refuel such equipment with a portable container, rather than from a fuel dispenser nozzle.
- Keep the nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete. Do not use a nozzle lock open device.
- If fuel is spilled on clothing, change clothing immediately.
- Never overfill fuel tank. Replace fuel cap and tighten securely.

Maintenance and Storage

- Disengage drives, set parking brake, stop engine and remove key or disconnect spark plug wire. Wait for all movement to stop before adjusting, cleaning or repairing.
- Clean grass and debris from cutting unit, drives, mufflers, and engine to help prevent fires. Clean up oil or fuel spillage.
- Let engine cool before storing and do not store near flame.
- Shut off fuel while storing or transporting. Do not store fuel near flames or drain indoors.
- Park machine on level ground. Set parking brake. Never 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 spark plug wire before making any repairs. Disconnect the negative terminal first and the positive last. Reconnect the positive first and negative last.
- Use care when checking blades. Wrap the blade(s) or wear gloves, and use caution when servicing them. Only replace blades. Never 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 truck.
- Use full width ramps for loading machine into trailer or truck.
- Tie the machine down securely using straps, chains, cable, or ropes. Both front and rear straps should be directed down and outward from the machine.

Toro 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 user and bystanders.

General Operation

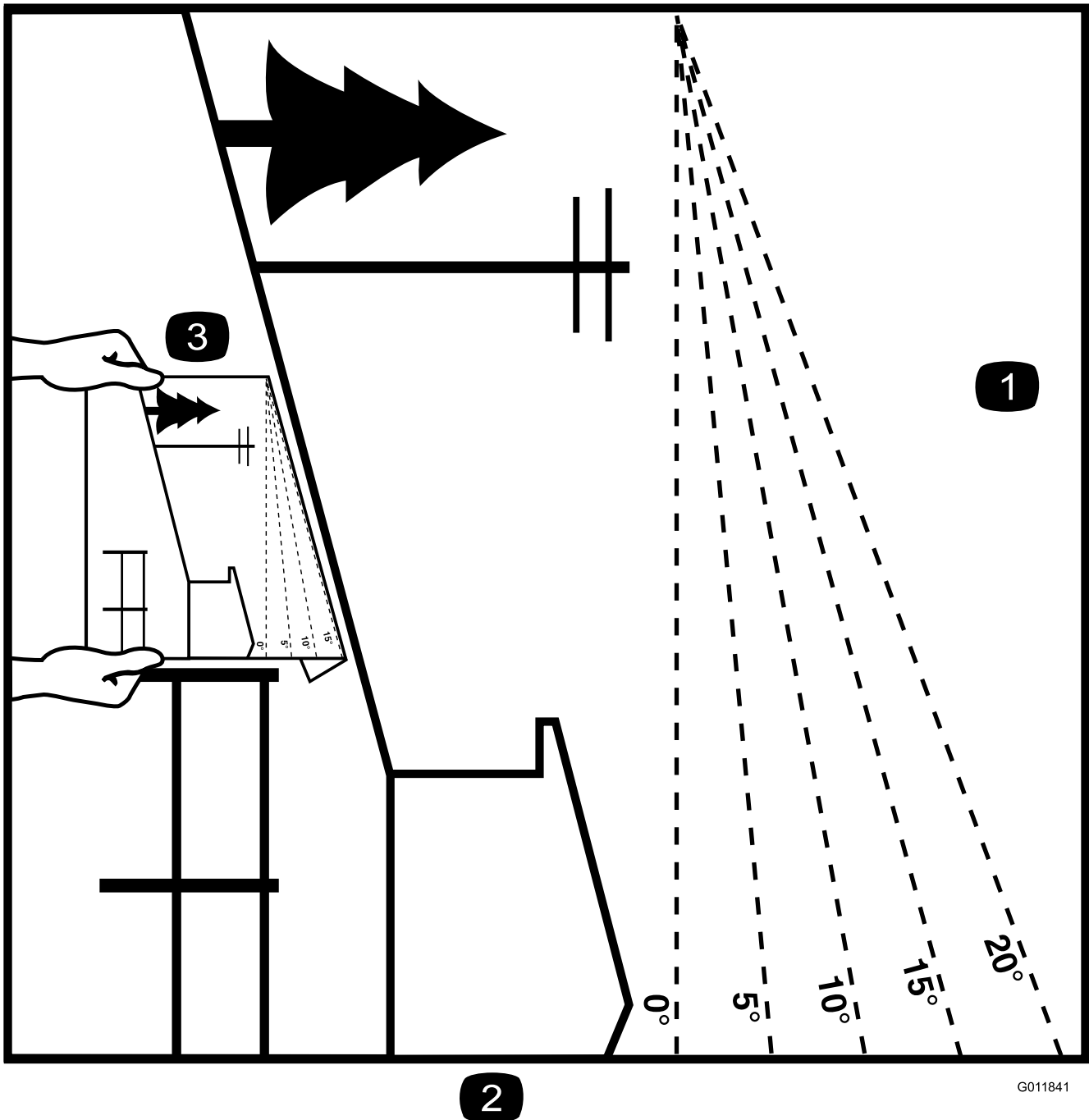
- Be sure the area is clear of other people before mowing. Stop the machine if anyone enters the area.
- Do not touch equipment or attachment parts which may be hot from operation. Allow to cool before attempting to maintain, adjust or service.
- Use only Toro approved attachments. Warranty may be voided if used with unapproved attachments.
- Check carefully for overhead clearances (i.e. branches, doorways, electrical wires) before operating under any objects and do not contact them.

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. Tall grass can hide obstacles.
- Use caution near drop-offs, ditches, or embankments. 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. 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.

Slope Indicator



2

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.



1-403005



82-2290



98-0776



52-2010



98-3256



66-1340



98-4387

1. Warning—wear hearing protection.



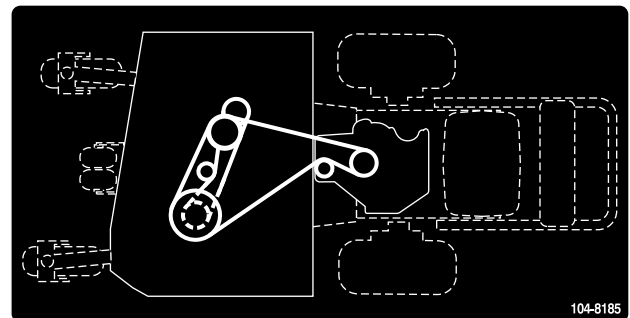
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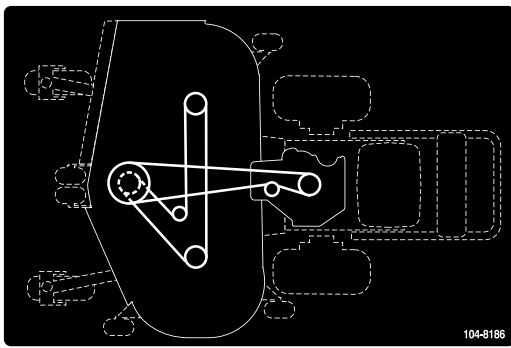
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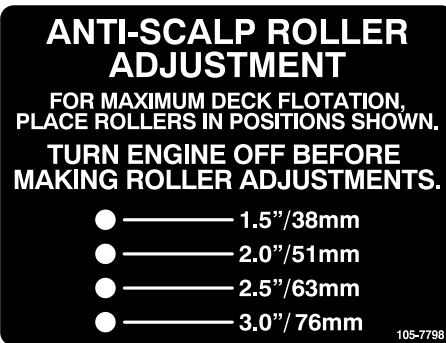
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104-8186
48 inch mower



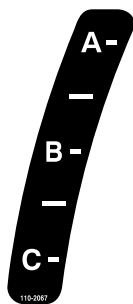
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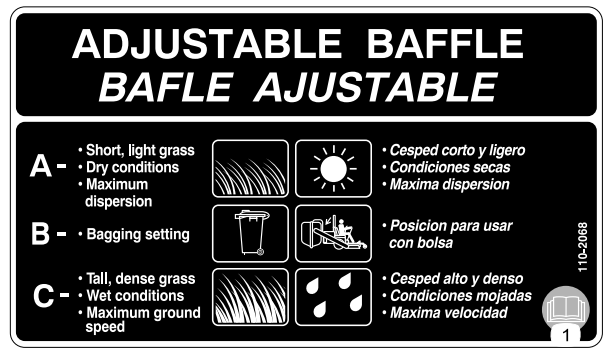
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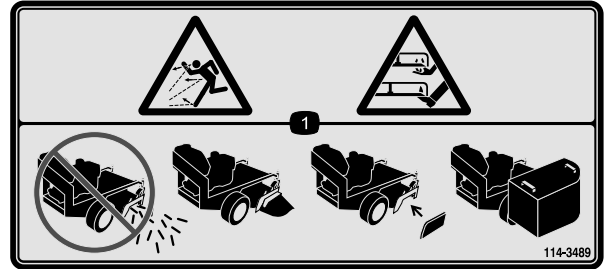


110-2067



110-2068

1. Read the *Operator's Manual*.

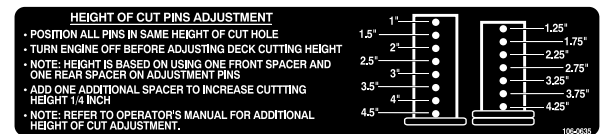


114-3489

1. Thrown object hazard; cutting/dismemberment hazard—do not operate the machine with the discharge opening uncovered; always operate the machine with the rear discharge deflector, discharge cover or grass collector installed.



117-2718



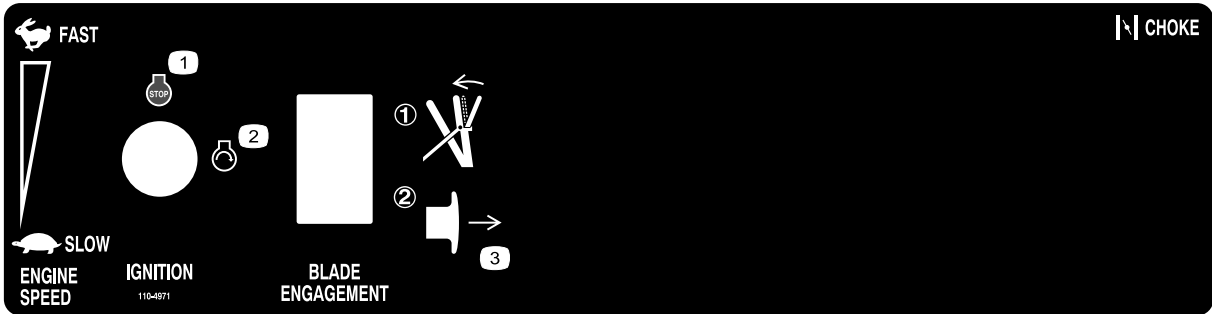
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⚠ DANGER AVOID SERIOUS INJURY or DEATH:

- DO NOT MOW WHEN CHILDREN OR OTHERS ARE AROUND.
- DO NOT ALLOW OPERATION OF THE MACHINE BY UNTRAINED PERSONNEL.
- KEEP SAFETY DEVICES (GUARDS, SHIELDS, ETC.) IN PLACE & WORKING.
- REMOVE OBJECTS THAT COULD BE THROWN BY THE BLADE.
- READ THE OPERATOR'S MANUAL FOR REPLACEMENT MANUAL. SEND MODEL AND SERIAL NUMBER TO: THE TORO CO., 8111 LYNDALE AVE. S., BLOOMINGTON, MN 55420-1196



105-0884



110-4971

1. Engine—stop
2. Engine—Start
3. Engage bale then pull out on the PTO to engage the blade.

Product Overview

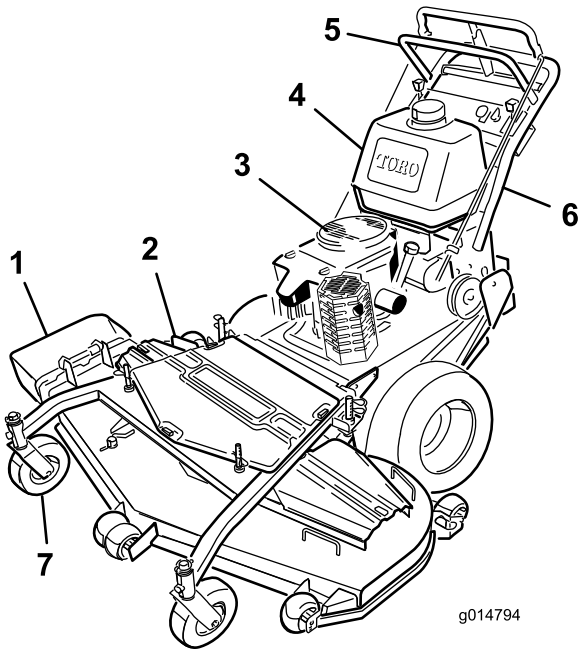


Figure 4

- | | |
|-------------------------|-----------------|
| 1. Side discharge chute | 5. Controls |
| 2. Mower deck | 6. Handle |
| 3. Recoil starter | 7. Caster wheel |
| 4. Gas tank | |

Controls

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

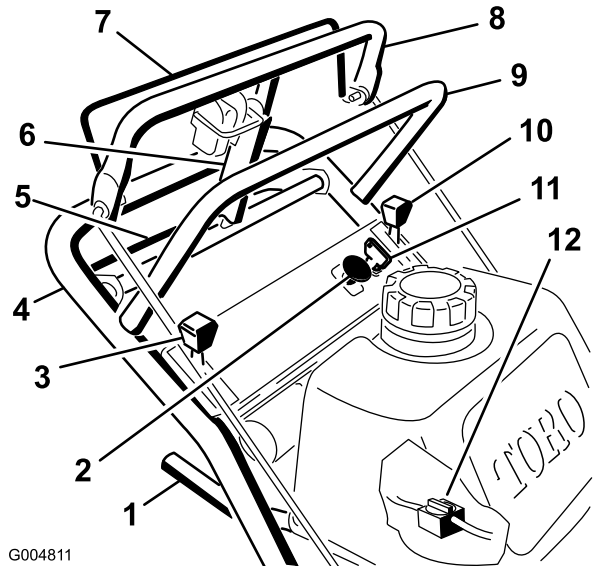


Figure 5

- | | |
|--|------------------------|
| 1. Gear shift lever | 7. Blade control bail |
| 2. Power take off switch (PTO) | 8. Upper control bar |
| 3. Choke control | 9. Upper handle |
| 4. Lower handle | 10. Throttle control |
| 5. Lower control bar | 11. Ignition switch |
| 6. Parking brake lever-released position | 12. Fuel shutoff valve |

Throttle Control

The throttle control has 2 positions: **Fast** and **Slow**.

Choke

Use the choke to start a cold engine.

Blade Control Bail

The bail is used in conjunction with the power take off switch (PTO) to engage the clutch to drive the mower blades. Release the mower control bail to disengage the mower blades.

Power Take Off Switch (PTO)

This pull switch is used in conjunction with the blade control bail to engage the clutch to drive the mower blades.

Gear Shift Lever

The transmission has 5 forward speeds, neutral, reverse, and has an in-line shift pattern.

Important: Do not shift while the unit is moving, as transmission damage may occur.

Upper Control Bar

Shift to the desired gear and push forward on the upper control bar to engage forward traction operation and pull back to brake forward movement. Pull back on right side of upper control bar to turn right and left side to turn left.

Lower Control Bar

Shift the transmission to reverse and squeeze the lower control bar and handle together to engage the rearward traction assist operation.

Parking Brake Lever

Pull back on the upper control bar and swing the brake lever up against the upper handle (Figure 5).

Ignition Switch

This switch is used in conjunction with the recoil starter and has 2 positions: **Run** and **Off**.

Recoil Starter

Pull the recoil starter handle to start the engine.

Fuel Shutoff Valve

Close the fuel shutoff valve when transporting or storing the machine.

Specifications

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

36 inch mowers:

Width with deflector down	130 cm (51–1/8 inches)
Length	210 cm (82–3/4 inches)
Height with handle in lowest position	105 cm (41–3/16 inches)
Weight	267 kg (588 lb)

48 inch mowers:

Width with deflector down	161 cm (63–1/2 inches)
Length	208 cm (82 inches)
Height with handle in lowest position	105 cm (41–3/16 inches)
Weight	294 kg (649 lb)

Attachments/Accessories

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

Operation

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

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 Oil Level in Engine Maintenance (page 23)

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

Think 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.



Figure 6

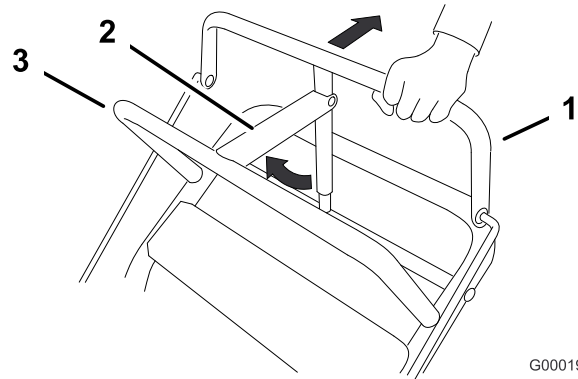
1. Warning—wear hearing protection.

Using the Parking Brake

Stop on level ground, disengage drives, engage parking brake, shut off engine, and remove key. Always set the parking brake when you stop the machine or leave it unattended.

Setting the Parking Brake

1. Pull the upper control bar (Figure 7) rearward and hold it in this position.
2. Lift the parking brake lock (Figure 7) up and gradually release the upper control bar. The brake lock should stay in the set (locked) position.



G000195

Figure 7

1. Upper control bar
2. Parking brake lever-set position
3. Fixed bar

Releasing the Parking Brake

1. Pull rearward on the upper control bar.
2. Lower the parking brake lock to the released position.
3. Gradually release the upper control bar.

Starting and Stopping the Engine

Starting the Engine

1. Make sure that the spark plug wire(s) are installed on the spark plug(s) and the fuel valve is open.
2. Move the shift lever to neutral, set the parking brake, and turn ignition key to run.
3. Move the throttle control to the fast position and move the choke lever to the on position before starting a cold engine.

Note: A warm or hot engine usually does not require any choking. To start a warm engine, move throttle control to the **fast** position.

4. Grasp the recoil starter handle firmly and pull out until positive engagement results; then pull the handle vigorously to start the engine and allow the rope to recoil slowly.

Important: Do not pull the recoil rope to its limit or let go of the starter handle when the rope is pulled out because the rope may break or the recoil assembly may become damaged.

Stopping the Engine

1. Move the throttle lever to the **slow** position (Figure 8).
2. Let engine idle for 30 to 60 seconds before turning the ignition key to **off**.
3. Turn the ignition key to **off** (Figure 8).

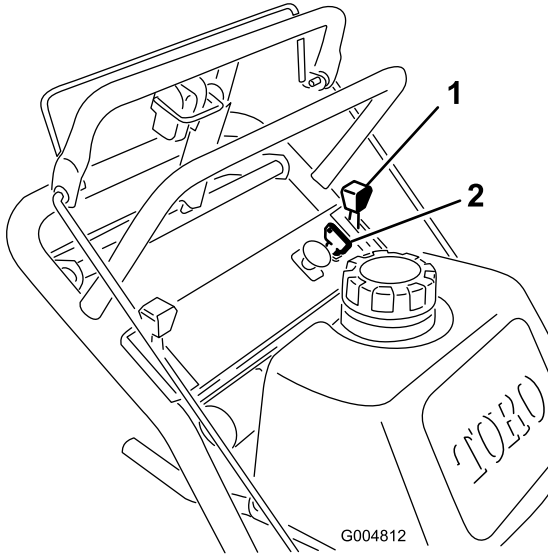


Figure 8

1. Throttle lever
2. Ignition key

4. Set the parking brake and remove the key.
5. Pull the wire off of the spark plug(s) to prevent the possibility of accidental starting of the engine before storing the machine.
6. Close the fuel shut off valve before storing the machine.

Important: Make sure that the fuel shut off valve is closed before transporting or storing the machine, as fuel leakage may occur.

Operating the Mower Power Take Off (PTO)

The power take off switch (PTO) in conjunction with the blade control bail engages and disengages power to the electric clutch and mower blades.

Engaging the Mower Blades (PTO)

1. Release the upper control bar to stop the machine (Figure 9).
2. To engage the blades, squeeze the blade control bail against the upper control bar (Figure 9).
3. Pull the power take off switch (PTO) up and release it.

Note: Hold the blade control bail against the upper control bar while operating the machine.

4. Repeat the procedure to engage the mower blades if the blade control bail is released.

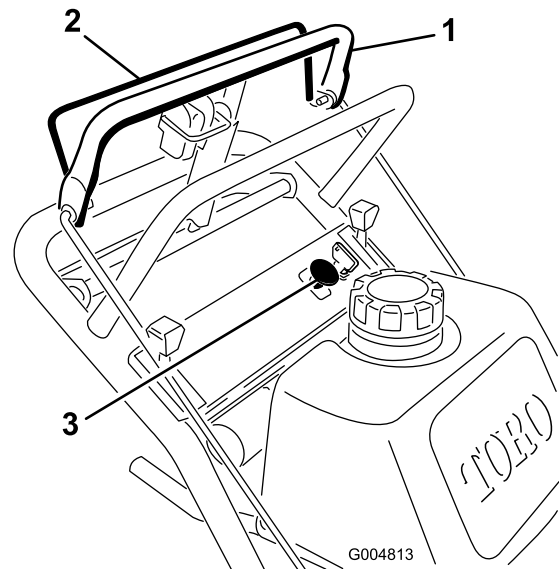


Figure 9

1. Upper control bar
2. Blade control bail
3. Power take off switch (PTO)

Disengaging the Mower Blades (PTO)

Release the blade control bail to disengage the blades (Figure 9).

The Safety Interlock System

⚠ CAUTION

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

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

Understanding the Safety Interlock System

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

- The control bail is pressed against the upper control bar.
- The power take off switch (PTO) is pulled **on**.

The safety interlock system is designed to stop the mower blades if you release the blade control bail.

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. Set the parking brake and start the engine; refer to Starting and Stopping the Engine.
2. Squeeze the blade control bail against upper control bar. **The blades should not rotate.**
3. Then continue holding the blade control bail and pull up on the blade control switch and release. The clutch should engage and the mower blades begin rotating.
4. Release the blade control bail. **The blades should stop rotating.**
5. With the engine running, pull up the power take off switch (PTO) and release without holding the blade control bail. **The blades should not rotate.**

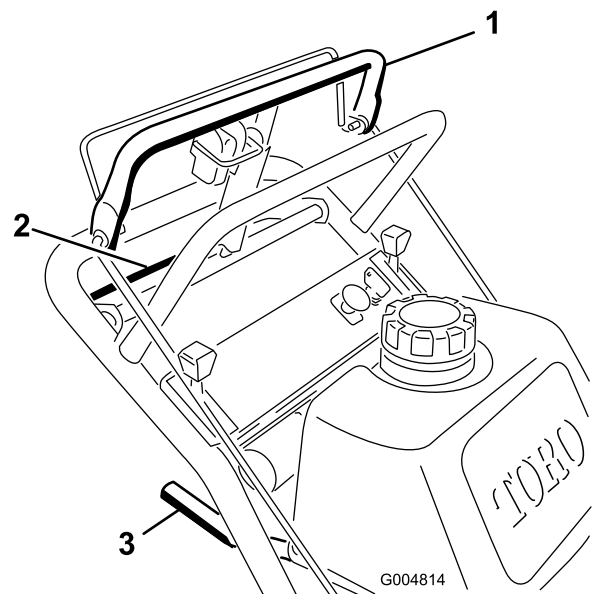


Figure 10

- | | |
|----------------------|----------------|
| 1. Upper control bar | 3. Shift lever |
| 2. Lower control bar | |

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 mowing performance.

Driving Forward

1. To go forward, move the shift lever to a forward gear (Figure 10).
2. Release the parking brake; refer to Releasing the Parking Brake in Operation.
3. Slowly press on the upper control bar to move forward (Figure 10).

To go straight, apply equal pressure to both ends of the upper control bar (Figure 10).

To turn, release pressure on the upper control bar side in the direction you want to turn (Figure 10).

Driving Backward

1. To go backward, move the shift lever to reverse gear.
2. Release the parking brake; refer to Releasing the Parking Brake.
3. Slowly squeeze the lower control bar and lower handle together to move rearward (Figure 10).

Using the Lower Control Bar

This procedure is for driving up a curb. This can be performed while driving forward or backward.

Note: Some curbs do not allow the rear drive tires to contact the curb. If this happens, drive the machine up the curb at an angle.

▲ WARNING

A blade can be bent or damaged when driving up a curb. Pieces of blade that may be thrown could seriously injure or kill you or bystanders.

Do not run blades while driving up a curb forward or backward.

Driving Forward up a Curb

1. Disengage the mower blades.
2. Select the first gear to drive the machine.
3. Drive machine until the caster wheels contact the curb (Figure 11).
4. Lift the front of the machine by pushing down on the lower handle (Figure 11).
5. Drive the machine until the drive wheels contact the curb (Figure 11).
6. Lower the front of the machine (Figure 11).

Note: Both drive wheels should contact the curb and caster wheels straight.

7. At the same time engage the lower control bar and lift up on the lower handle to drive over the curb (and Figure 11).

Note: Lifting up on the lower handle will assist driving the machine up a curb and not spin the drive wheels.

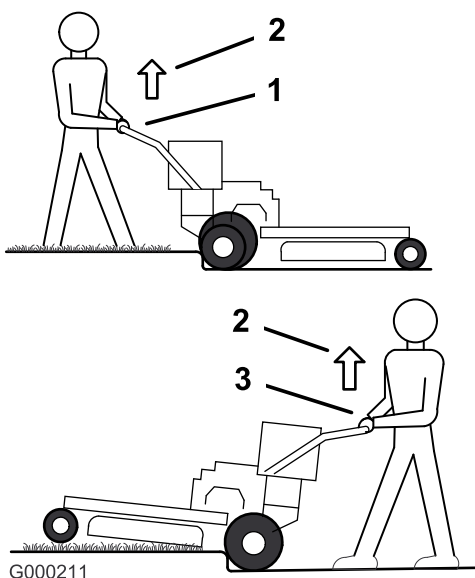


Figure 11

1. Lower control bar engaged and mower in reverse
2. Pull up to assist machine
3. Lower control bar engaged and mower going forward

Note: Lifting up on the lower handle will assist driving the machine up a curb and not spin the drive wheels.

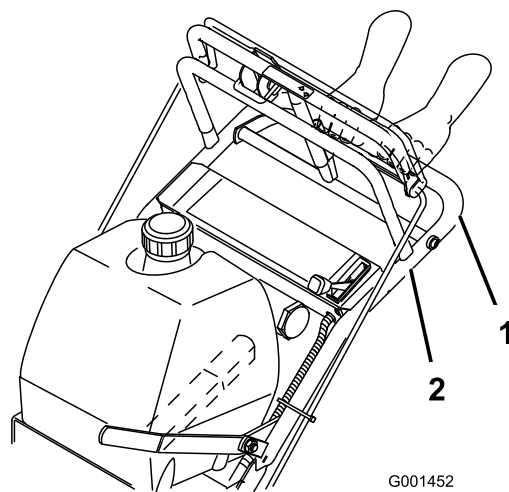


Figure 12

1. Lower control bar (engaged)
2. Handle

Driving Backward up a Curb

1. Disengage the mower blades.
2. Select reverse to drive the machine.
3. Drive the machine until drive wheels contact curb (Figure 11).

Note: Both drive wheels should contact the curb and caster wheels straight.

4. At the same time engage lower control bar and lift up on the lower handle (and Figure 12).

Stopping the Machine

To stop the machine, pull back on the upper control bar, release the blade control bail, and turn the ignition key to off. Also set the parking brake if you leave the machine unattended; refer to Setting the Parking Brake in (page). 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.

Transporting Machines

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 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 13).

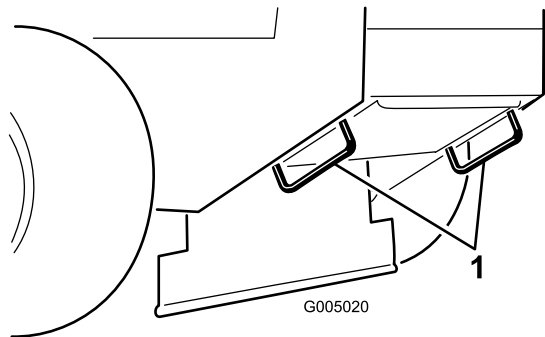


Figure 13

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. Adjustments are done by relocating the 4 hairpin cotter pins in different hole locations and by adding or removing spacers.

Note: All height-of-cut pins need at least 1 spacer or damage can occur to the bushing.

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

1. Select a hole in the height-of-cut post and the number of spacers corresponding to the height-of-cut desired (Figure 14).
2. Using the lift handle, raise the side of the deck and remove the hairpin cotter (Figure 14).
3. Add or remove spacers if needed and then align the holes and insert the hairpin cotter (Figure 14).

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

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

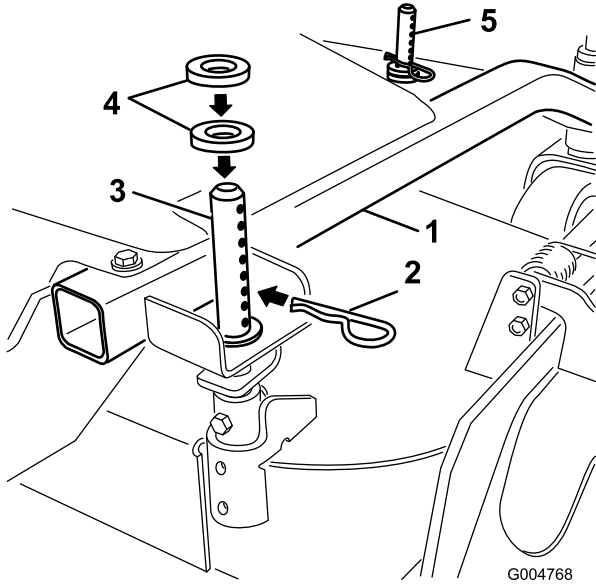


Figure 14

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

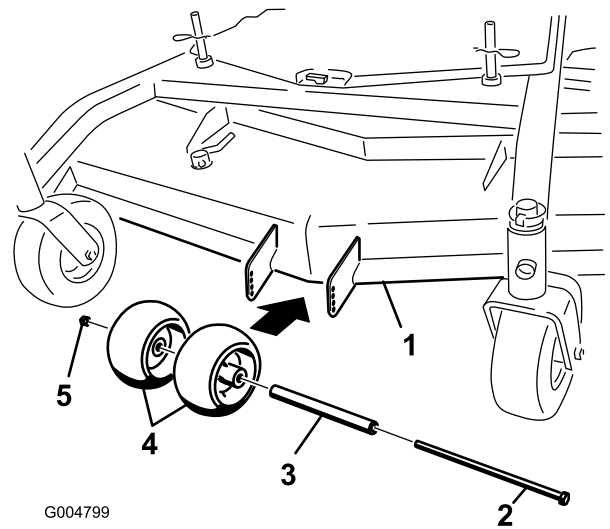


Figure 15
48 inch Mower Decks

- | | |
|---------------|-----------------------|
| 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 the 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 15, Figure 16, Figure 17).
2. If an adjustment is needed, remove the bolt, washers, and nut (Figure 15, Figure 16, Figure 17).
3. Select a hole position so that the anti-scalp rollers are a minimum of 10 mm (3/8 inch) off of the ground (Figure 15, Figure 16, Figure 17).
4. Install the bolt and nut (Figure 15, Figure 16, Figure 17).

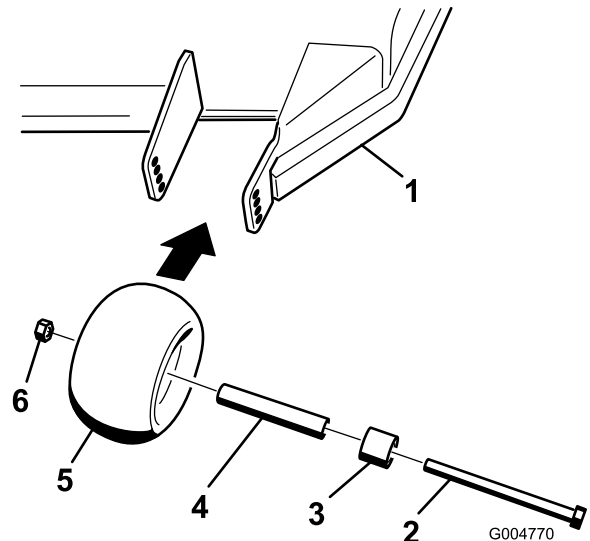
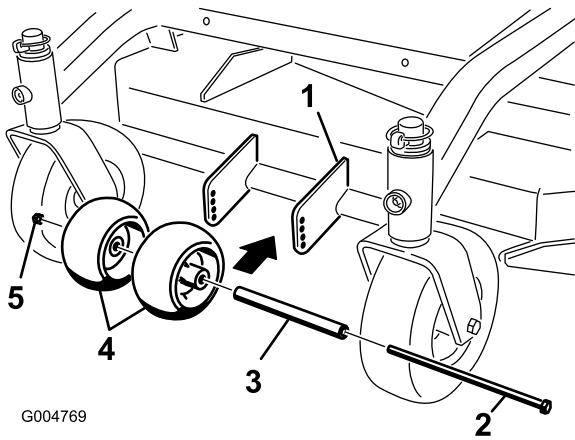


Figure 16
48 inch Mower Decks

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



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Figure 17
36 inch Mower Deck

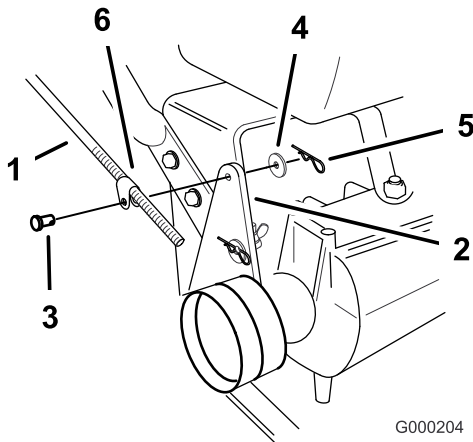
- | | |
|---------------|-----------------------|
| 1. Mower deck | 4. Anti-scalp rollers |
| 2. Bolt | 5. Nut |
| 3. Spacer | |

Note: 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 Handle Height

The handle position can be adjusted to match the operator's height preference.

1. Remove the hairpin cotter, washer, and clevis pin securing the control rod fitting to the idler bracket (Figure 18).

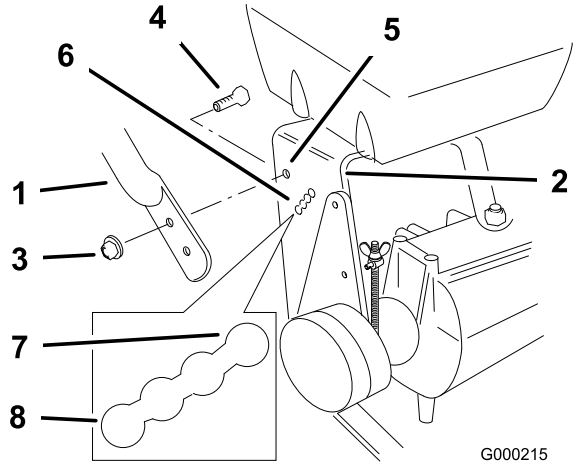


G000204

Figure 18

- | | |
|----------------------------|-------------------|
| 1. Control rod and fitting | 4. Washer |
| 2. Idler bracket | 5. Hairpin cotter |
| 3. Clevis pin | 6. Rod fitting |

2. Loosen the upper flange bolts (3/8 x 1 inch) and the flange nut securing the handle to the rear frame (Figure 19).



G000215

Figure 19

- | | |
|--------------------------------|-------------------------|
| 1. Upper handle | 5. Upper mounting hole |
| 2. Rear frame | 6. Lower mounting holes |
| 3. Flange nut, (3/8 inch) | 7. Low position |
| 4. Flange bolt, (3/8 x 1 inch) | 8. High position |

3. Remove the lower flange bolts (3/8 x 1 inch) and flange nuts securing the handle to the rear frame (Figure 19).
4. Pivot the handle to the desired operating position and install the lower flange bolts (3/8 x 1 inch) and the flange nuts into the mounting holes. Tighten all of the flange bolts.
5. Check the control bar for correct adjustment. Refer to Adjusting the Control Bar in the maintenance section.
6. Check the parking brake adjustment. Refer to Checking the Brakes in the maintenance section.

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.

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. To adjust the baffle, loosen the nut (Figure 20).
4. Adjust the baffle and nut in the slot to the desired discharge flow and tighten the nut.

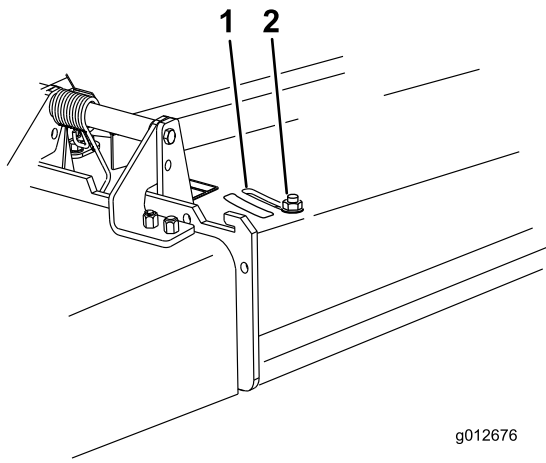


Figure 20

1. Slot 2. Nut

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Position B

Use this position when bagging (Figure 22).

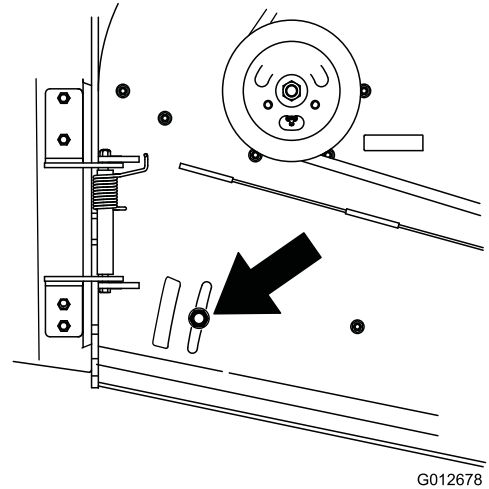


Figure 22

G012678

Positioning the Flow Baffle

The following figures are only recommendations for use. Adjustments will vary by grass type, moisture content, and height of 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 21). 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.

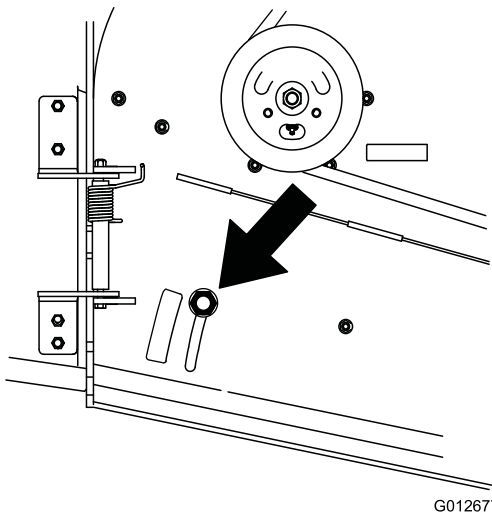


Figure 21

G012677

Position C

This is the full open position. The suggested use for this position is as follows (Figure 23).

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

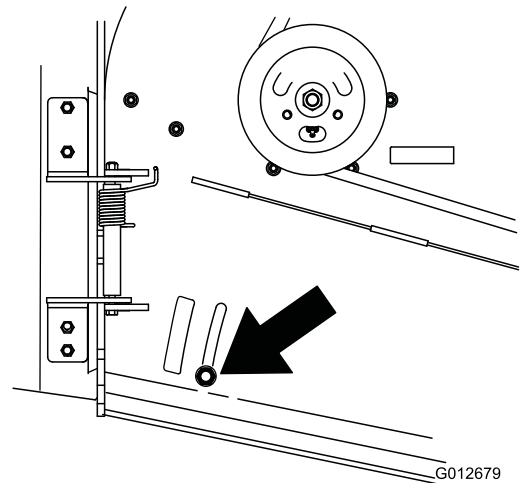


Figure 23

G012679

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 24 or Figure 25).

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
36 inches	none	none
48 inches	2	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.

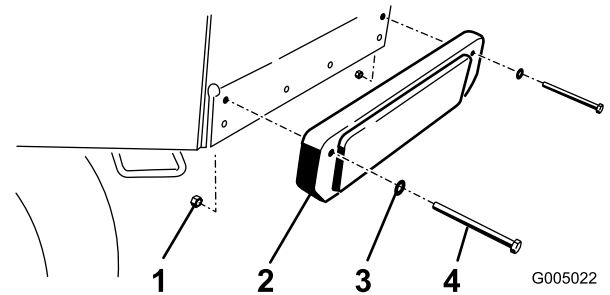


Figure 25

Installing the rear weight.

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

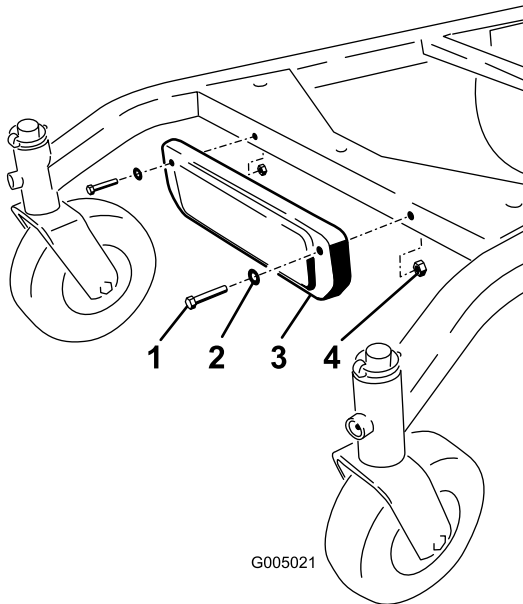


Figure 24

Installing the front weight.

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

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.
Before each use or daily	<ul style="list-style-type: none">• Check the safety interlock system.• Grease the caster wheels and caster pivot.• Check the engine oil level.• Clean the air intake screen.• Check the brakes on both a level surface and slope.• Inspect the blades.
Every 25 hours	<ul style="list-style-type: none">• Clean foam air cleaner element.
Every 50 hours	<ul style="list-style-type: none">• Grease the PTO belt idler.• Grease the mower deck belt idler.• Check the paper air cleaner element.• Check the tire pressure• Check the traction drive belt• Check the transmission belt.• Check the mower belt.• Check the PTO drive belt.
Every 100 hours	<ul style="list-style-type: none">• Change the engine oil.• Check the spark plugs.• Adjust the electric clutch.
Every 200 hours	<ul style="list-style-type: none">• Replace the paper air cleaner element.• Change the oil filter.• Replace the fuel filter.
Every 250 hours	<ul style="list-style-type: none">• Grease the transmission couplers (more often in dirty or dusty conditions).
Every 400 hours	<ul style="list-style-type: none">• Grease the front wheel bearings (more often in dirty or dusty conditions).
Before storage	<ul style="list-style-type: none">• Paint chipped surfaces.• Perform all maintenance procedures listed above before storage.

Important: Refer to your engine operator'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.

Greasing the Machine

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. Make sure to scrape any paint off the front of the fitting(s).
4. Connect a grease gun to the fitting. Pump grease into the fittings until grease begins to ooze out of the bearings.
5. Wipe up any excess grease.

Lubricating the Caster and Wheel Bearings

Service Interval: Before each use or daily

Every 400 hours

1. Lubricate the front caster wheel bearings and front pivots (Figure 26).

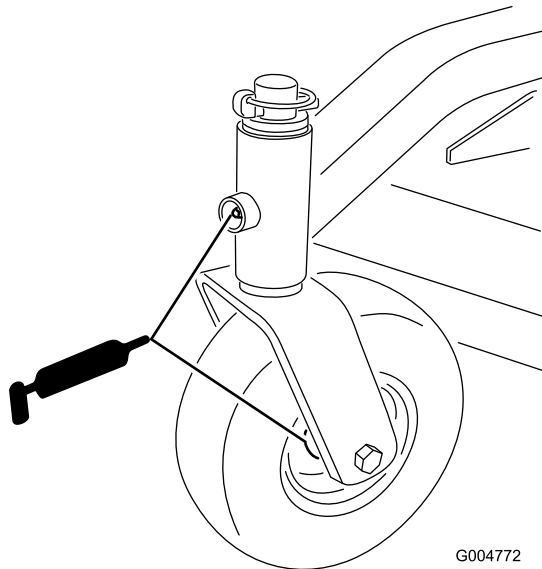


Figure 26

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

Greasing the Transmission Couplers

Service Interval: Every 250 hours

Lubricate the transmission couplers located in the back of the machine (Figure 27).

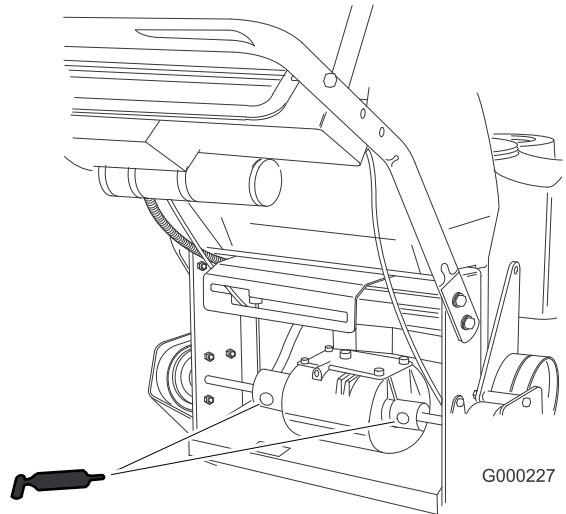


Figure 27

Greasing the PTO Drive Belt Idler and Mower Deck Belt Idler

Service Interval: Every 50 hours—Grease the PTO belt idler.

Every 50 hours—Grease the mower deck belt idler.

Grease the idler pulley pivots (Figure 28 or Figure 29).

Note: Remove the carrier covers to access the grease fitting for the mower deck.

2. Raise the rear of the machine and use jack stands to support the machine.
3. Remove the rear wheel and tire assemblies.
4. Remove the rear wheel grease cap. Lubricate the rear wheel bearing (Figure 26).
5. Install the grease cap.
6. Install the rear wheel and tire assembly.

Engine Maintenance

Servicing the Air Cleaner

Service Interval: Every 25 hours—Clean 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.

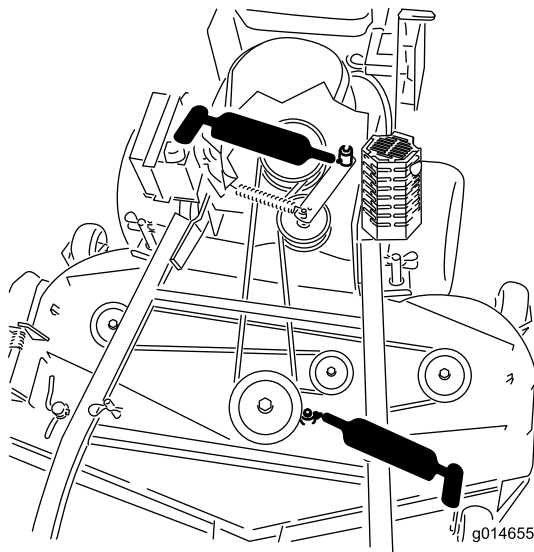


Figure 28
48 inch Mower Deck shown

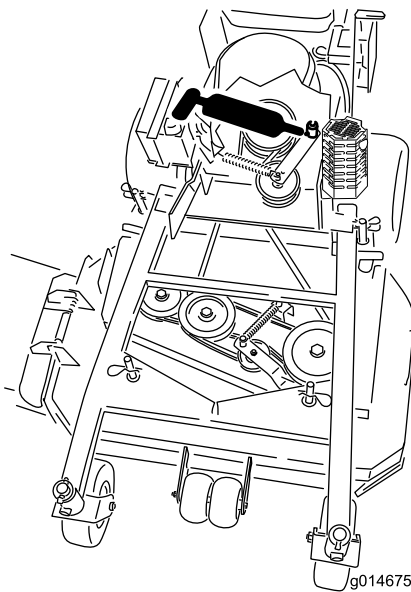


Figure 29
36 inch Mower Deck shown

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 30).

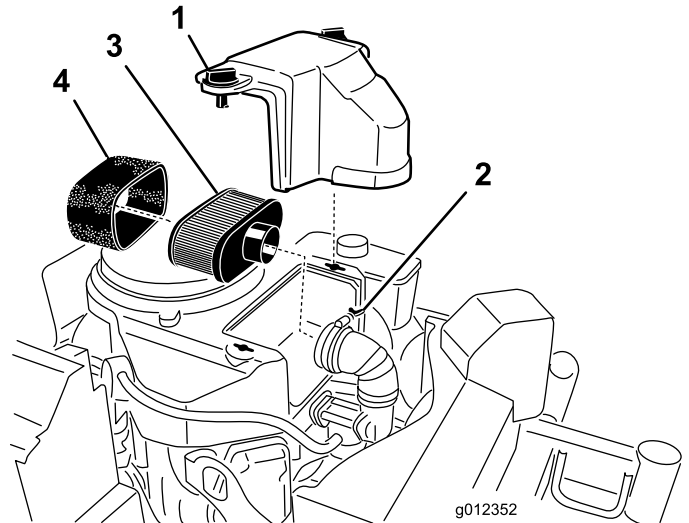


Figure 30

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

4. Unscrew the cover knobs and remove the air cleaner cover (Figure 30).
5. Unscrew the hose clamp and remove the air cleaner assembly (Figure 30).
6. Carefully pull the foam element off the paper element (Figure 30).

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 30).
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 30).
2. Place the air cleaner assembly onto the air cleaner base and secure it with the 2 wing nuts (Figure 30).
3. Place the air cleaner cover into position and tighten the cover knob (Figure 30).

Servicing the Engine Oil

Service Interval/Specification

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: 58 ounces (1.7 liter) with the filter removed; 51 ounces (1.5 liter) without the filter removed

Viscosity: Refer to the table (Figure 31).

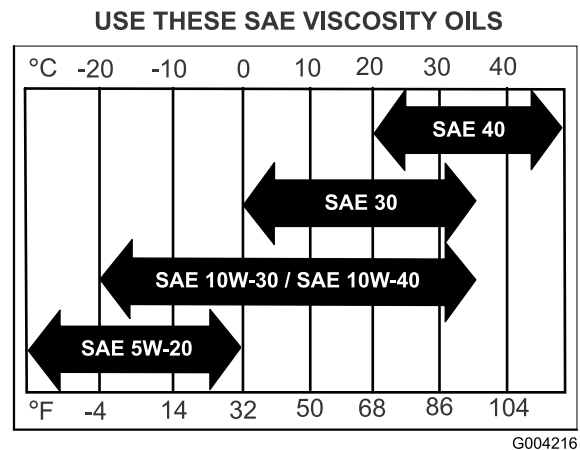


Figure 31

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 32) so that dirt cannot fall into the filler hole and damage the engine.

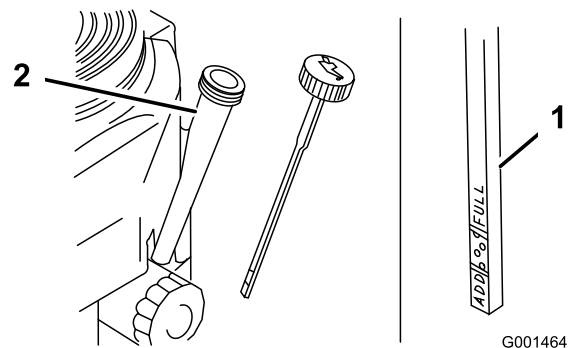


Figure 32

1. Oil dipstick
2. Filler tube

5. Unscrew the oil dipstick and wipe the end clean (Figure 32).
6. Slide the oil dipstick fully into the filler tube, but do not thread onto tube (Figure 32).
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 assure 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 pan below the drain hose. Rotate oil drain valve to allow oil to drain (Figure 33).
6. When oil has drained completely, close the drain valve.
7. Remove the drain hose (Figure 33).

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

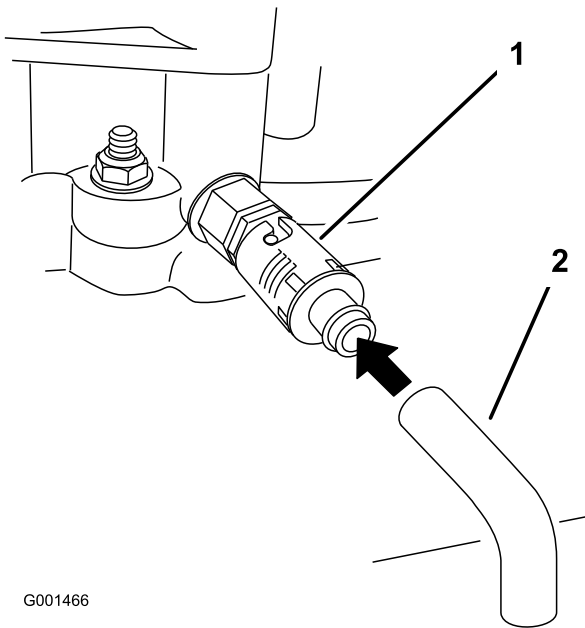


Figure 33

1. Oil drain valve
2. Oil drain hose

8. Slowly pour approximately 80% of the specified oil into the filler tube (Figure 32).
9. Check the oil level; refer to Checking the Engine Oil Level.
10. Slowly add the additional oil to bring it to the **Full** mark.

Changing the 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.
2. Remove the old filter (Figure 34).

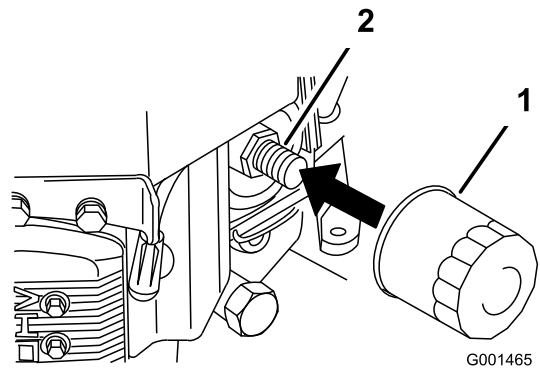


Figure 34

1. Oil filter
2. Adapter

3. Apply a thin coat of new oil to the rubber gasket on the replacement filter (Figure 34).
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 34).
5. Fill the crankcase with the proper type of new oil; refer to Servicing the Engine Oil.
6. Run the engine for about 3 minutes, stop the engine, and check for oil leaks around the oil filter and 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—Check the spark plugs.

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 (0.030 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 35).

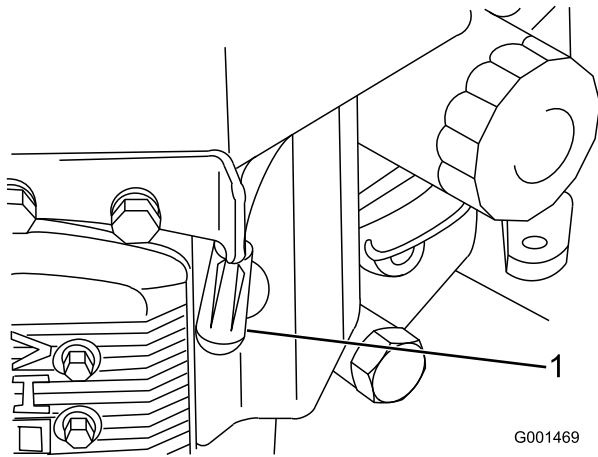


Figure 35

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 36). 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.

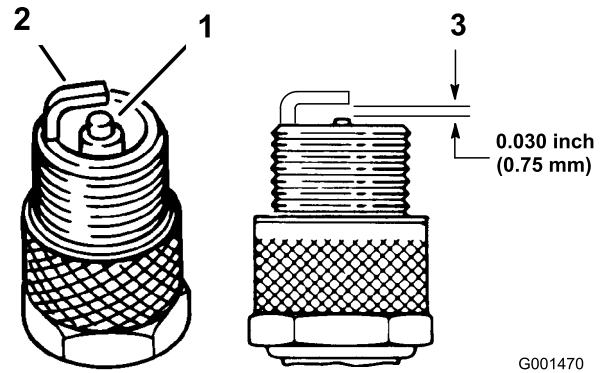


Figure 36

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 36). Bend the side electrode (Figure 36) 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 36).

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 ensure the fuel tank drains completely. Then disengage the power take off (PTO), set the parking brake, and turn the ignition key to **off**. Remove the key.
2. Close the fuel shut-off valve at the fuel tank (Figure 37).
3. Squeeze the ends of the hose clamp together and slide it up the fuel line away from fuel filter (Figure 37).
4. Pull the fuel line off the fuel filter (Figure 37). Open the fuel shut-off 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.

5. Install the fuel line onto the fuel filter. Slide the hose clamp close to the valve to secure the fuel line.

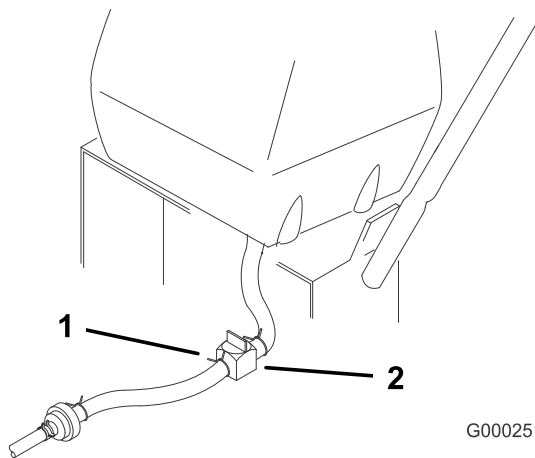


Figure 37

1. Fuel shut-off valve
2. Clamp

Replacing the Fuel Filter

Service Interval: Every 200 hours

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

Note: Note how the fuel filter is installed.

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 shut-off valve at fuel tank (Figure 37).

Note: Remove the fuel line from the fuel valve that is closest to the engine.

4. Squeeze the ends of the hose clamps together and slide them away from the filter (Figure 38).

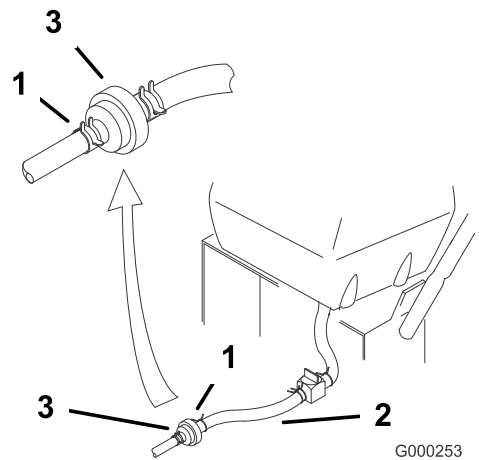


Figure 38

1. Hose clamp
2. Fuel line
3. Filter

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 shut-off valve at fuel tank (Figure 37).
8. Check for fuel leaks and repair if needed.

Electrical System Maintenance

Servicing the Fuse

The electrical system is protected by a fuse. It requires no maintenance. If the fuse blows, check the component or circuit for malfunction or a short. To replace the fuse, pull out on the fuse (Figure 39) to remove or replace it.

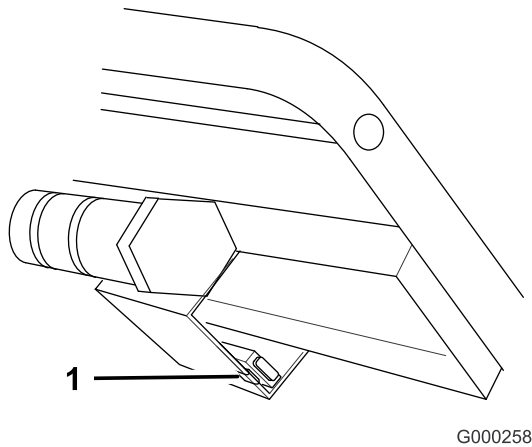


Figure 39

1. Fuse, 7.5 amp, blade type

Drive System Maintenance

Adjusting the Control Bar

1. Check the gap between upper control bar and fixed bar with wheel drive fully engaged. The gap should be approximately 25-32 mm (1 to 1-1/4 inch) (Figure 40).

Note: The upper control bar and fixed bar must be parallel when the upper control bar is in the engaged, drive, neutral, or brake positions.

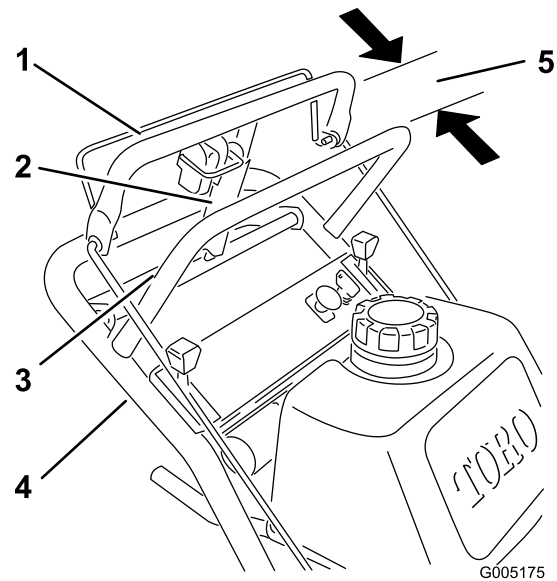


Figure 40

- | | |
|------------------------|----------------------------------|
| 1. Upper control bar | 4. Handle |
| 2. Parking brake lever | 5. 25-32mm (1 to 1-1/4 inch) gap |
| 3. Fixed control bar | |

2. Check the operation. If adjustment is required, remove the hairpin cotter, washer, and clevis pin securing the control rod fitting to idler bracket (Figure 41).
3. Thread the rod fitting up or down on the rod until the proper position is attained and install the rod fitting to the idler bracket with the clevis pin, washer, and hairpin cotter.

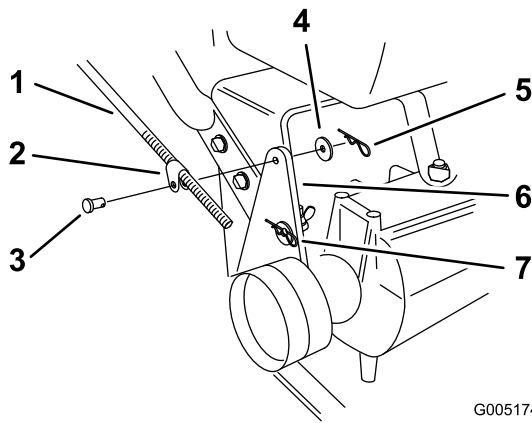


Figure 41

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- | | |
|----------------------------|-----------------------|
| 1. Control rod and fitting | 5. Washer |
| 2. 89 mm (3-1/2 inch) | 6. Hairpin cotter pin |
| 3. Idler bracket | 7. Rod fitting |
| 4. Clevis pin | 8. Hole F |

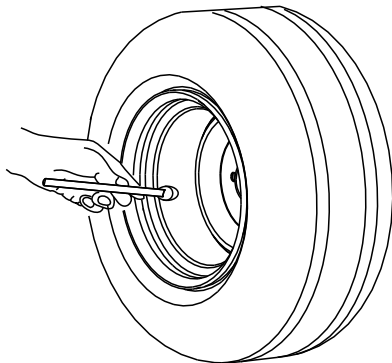
Checking the Tire Pressure

Service Interval: Every 50 hours/Monthly (whichever comes first)—Check the tire pressure

Check the pressure at the valve stem (Figure 42).

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

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



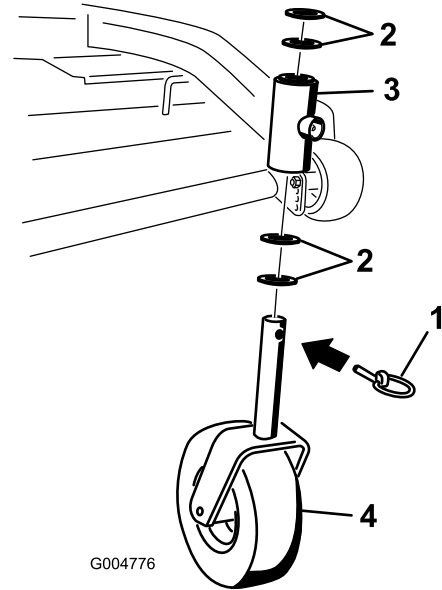
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Figure 42

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 that the caster wheels are off of 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 43).



G004776

Figure 43

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

3. Pull the caster wheel fork out of the mounting tube, leaving the spacer(s) on the bottom of the fork. 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 44). Clean the inside of the mounting tube.

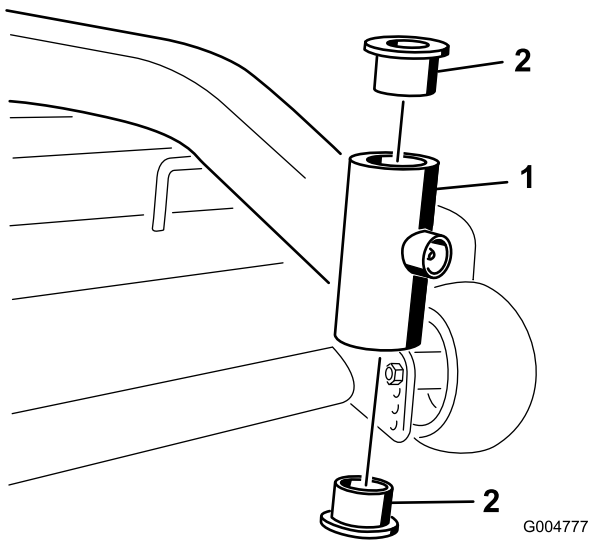


Figure 44

1. Mounting Tube 2. Bushing

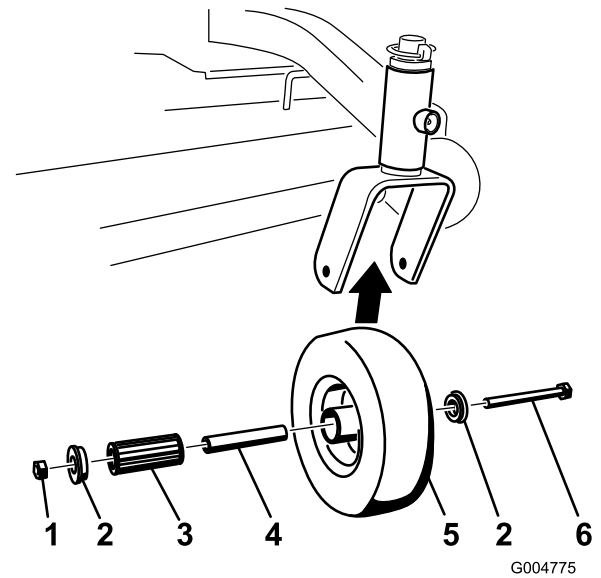


Figure 45

1. Locknut 4. Spanner bushing
 2. Cap 5. Wheel
 3. Roller bearing 6. Bushing

5. Grease the inside and outside of the new bushings. Use a hammer and flat plate to carefully drive the bushings into the pivot tubes.
6. Inspect the caster wheel fork for wear and replace if necessary (Figure 43).
7. Slide the caster wheel fork through the bushings in the mounting tube. Replace the spacer(s) onto the fork and secure with the retaining ring (Figure 43).

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 (1.126 inch).

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

2. Remove one bushing, then pull the spanner bushing and roller bearing out of the wheel hub (Figure 45).
3. Remove the other bushing from the wheel hub and clean any grease and dirt from the wheel hub (Figure 45).
4. Inspect the roller bearing, bushings, spanner bushing, and inside of the wheel hub for wear. Replace any defective or worn parts (Figure 45).
5. To assemble, place one bushing into the wheel hub. Grease the roller bearing and spanner bushing and slide them into the wheel hub. Place the second bushing into the wheel hub (Figure 45).
6. Install the caster wheel into the caster fork and secure with the wheel bolt and locknut. Tighten the locknut until the spanner bushing bottoms against the inside of the caster forks (Figure 45).
7. Grease the fitting on the caster wheel.

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 45).

Adjusting the Electric Clutch

Service Interval: Every 100 hours

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

1. Insert a 0.381–0.533 mm (0.015–0.021 inch) feeler gauge through one inspection slot in the side of the assembly. Make sure it is between the armature and the rotor friction surfaces.
2. Tighten the locknuts until there is a slight binding on the feeler gauge but it can be moved easily within the air gap (Figure 46).
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.

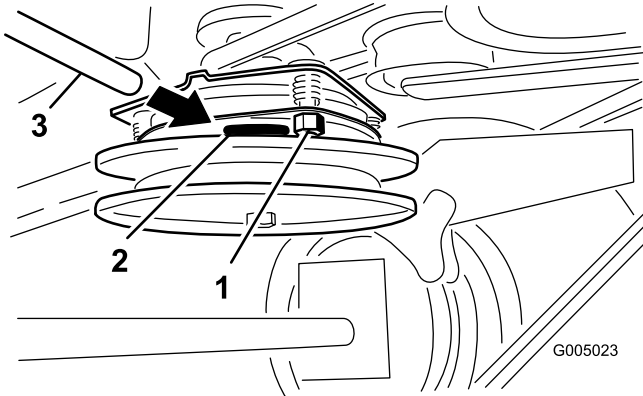


Figure 46

1. Adjusting nut
2. Slot
3. Feeler gauge

Cooling System Maintenance

Cleaning the Air-intake Screen

Service Interval: Before each use or daily

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

Brake Maintenance

Servicing the Brakes

Service Interval: Before each use or daily—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 Brakes

1. Park the machine on a level surface, 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. The wheels must lock when you try to push the machine forward.
4. If the wheels do not lock, adjust the brakes. Refer to Adjusting the Brakes.
5. Release the brake and press upper control bar very lightly, approximately 13 mm (1/2 inch). The wheels should rotate freely, if not; refer to Adjusting the Brakes.

Adjusting the Brakes

The brake lever is on the upper control bar. If the parking brake does not hold securely, an adjustment is required.

Note: For the initial adjustment, adjust the wing nut until it is 1-1/4 inches from the top of the rod (Figure 47).

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 Brakes.
4. Release the parking brake; refer to Releasing the Parking Brake.
5. To adjust the brake remove the hair pin cotter and washer from the brake lever and trunnion (Figure 47).

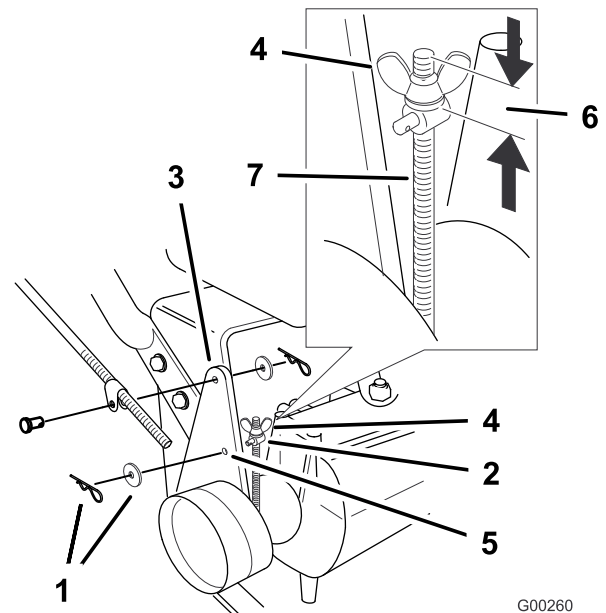


Figure 47

G00260

- | | |
|------------------------------|---|
| 1. Hairpin cotter and washer | 5. Hole F |
| 2. Trunnion | 6. Initial adjustment- 32 mm (1-1/4 inch) |
| 3. Brake lever | 7. Rod |
| 4. Wing nut | |

6. Rotate the wing nut clockwise to increase the braking pressure.
7. Rotate the wing nut counterclockwise to decrease the braking pressure.
8. Install the trunnion into hole F (Figure 47). Tighten the wing nut.
9. Secure trunnion to brake lever with washer and hair pin cotter (Figure 47).
10. Check the brake operation again; refer to Checking the Brakes.

Important: With the parking brake released, the rear wheels must rotate freely when you push the mower. If brake action and free wheel rotation cannot be achieved contact your service dealer immediately.

Belt Maintenance

Replacing the Traction Drive Belt

Service Interval: Every 50 hours/Monthly (whichever comes first)—Check the traction drive belt

Look for cracks, wear, and signs of overheating.

1. Remove the top bolt securing idler support and idler bracket to rear frame (Figure 48).

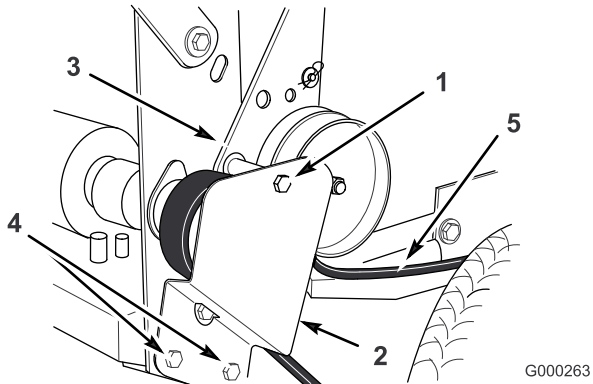


Figure 48

- | | |
|------------------|------------------------|
| 1. Top bolt | 4. Bottom bolt |
| 2. Idler bracket | 5. Traction drive belt |
| 3. Idler support | |

5. Disconnect the clutch wire connector from the wire harness.
6. Disconnect the clutch retainer from the engine deck (Figure 49).

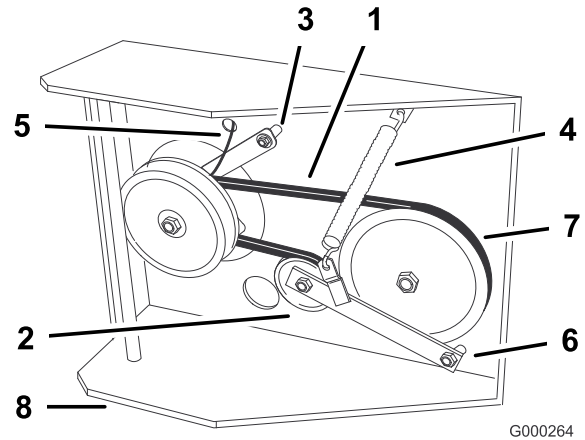


Figure 49

- | | |
|----------------------|--------------------------|
| 1. Transmission belt | 5. Clutch wire connector |
| 2. Idler pulley | 6. Pivot bolt |
| 3. Clutch retainer | 7. Drive pulley |
| 4. Tension spring | 8. Engine deck |

2. Loosen bottom 2 mounting screws enough to allow belt to pass between drive pulley and idler support (Figure 48).
3. Raise the wheel off the ground, to allow the belt to be removed, and remove the belt.
4. Install a new belt.
5. Install the top bolt securing the idler support and idler bracket to the rear frame (Figure 48).
6. Tighten the bottom 2 mounting screws enough to allow the belt to pass between the drive pulley and the idler support (Figure 48).

Replacing the Transmission 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 the PTO drive belt. Refer to Replacing the PTO Drive Belt in the Belt Maintenance (page 33).
4. Raise the front of the machine and hold with jack stands.

7. Unhook the tension spring from the side of the frame (Figure 49).
8. Loosen the pivot bolt enough to remove the traction belt from the drive pulley and clutch.
9. Install the new belt around the clutch and drive pulley.
10. Torque pivot bolt to 47-54 N-m (35-40 ft-lb).
11. Install the tension spring between the idler arm and frame bracket (Figure 49).
12. Install the clutch retainer to the engine deck (Figure 49).
13. Connect the clutch wire connector to the wire harness.
14. Install the PTO drive belt.

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.

6. Disconnect the idler arm spring to relieve tension on the idler arm and idler pulley, then remove the worn mower belt (Figure 50 or Figure 51).
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 50 or Figure 51).
8. Connect the idler arm spring (Figure 50 or Figure 51).
9. Install the PTO drive belt. Refer to Replacing the PTO Drive Belt.
10. Adjust the belt guide an 3 mm (1/8 inch) from the belt (Figure 50 or Figure 51).
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.

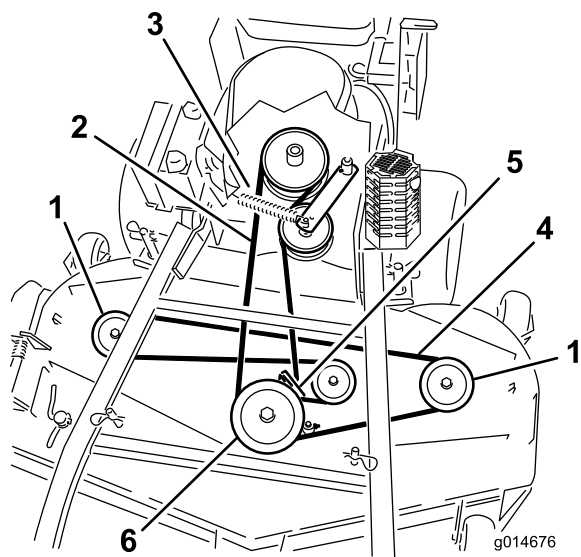


Figure 50
48 inch Mower Deck shown

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

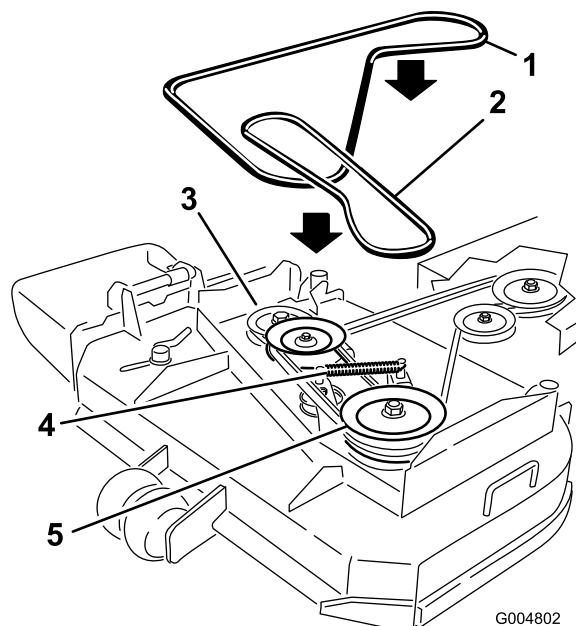


Figure 51
36 inch Mower Deck shown

- | | |
|----------------------|----------------------|
| 1. Mower deck belt | 4. Idler arm spring |
| 2. PTO drive belt | 5. Drive belt pulley |
| 3. Drive belt 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 52).

Refer to Figure 53 to roll the belt off left pulley for a 36 inch mower deck.

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 52).

Refer to Figure 53 to remove the belt from the 36 inch mower deck pulleys.

8. Install the new belt onto the engine pulley and spring loaded idler pulley (Figure 52).

9. Roll the belt onto the center pulley on the mower deck (Figure 52).

Refer to Figure 53 to roll the new belt onto the left pulley for a 36 inch mower deck.

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

10. Install the heat shield to the engine deck and carrier frame.
11. Adjust the belt guide an 3 mm (1/8 inch) from the belt for 48 inch mower decks (Figure 52).
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.

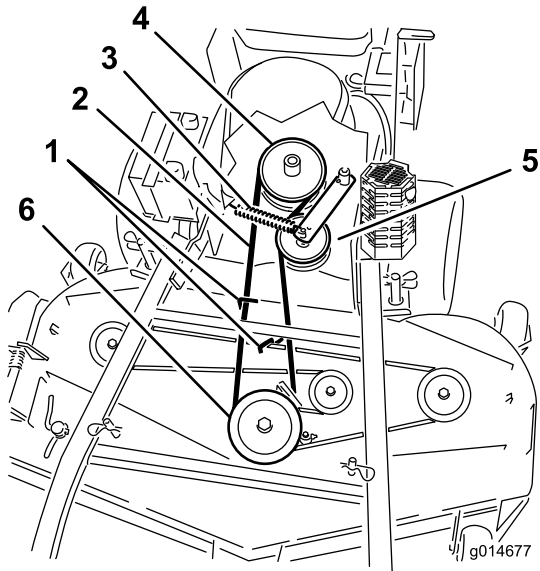


Figure 52
48 inch Mower Deck shown

- | | |
|-------------------------|--------------------------------|
| 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 |

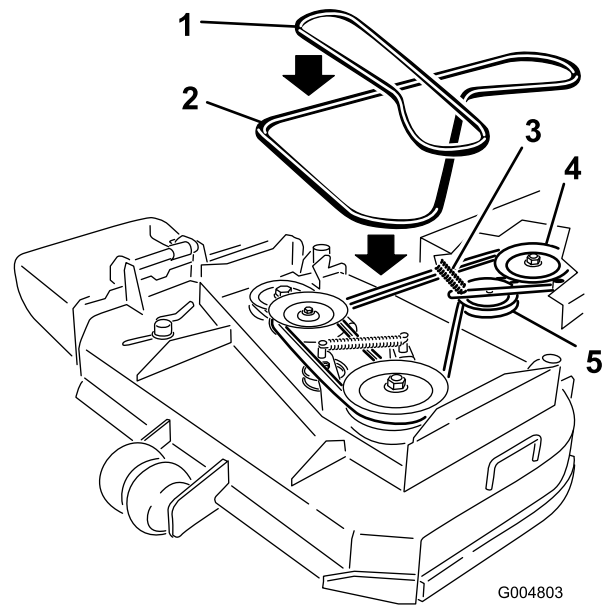


Figure 53
36 inch Mower Deck shown

- | | |
|-------------------------|------------------|
| 1. Mower deck belt | 4. Clutch pulley |
| 2. PTO drive belt | 5. Idler pulley |
| 3. Idler arm and spring | |

Adjusting the PTO Drive Belt Idler Spring Anchor

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

Use Figure 54 for the idler position options.

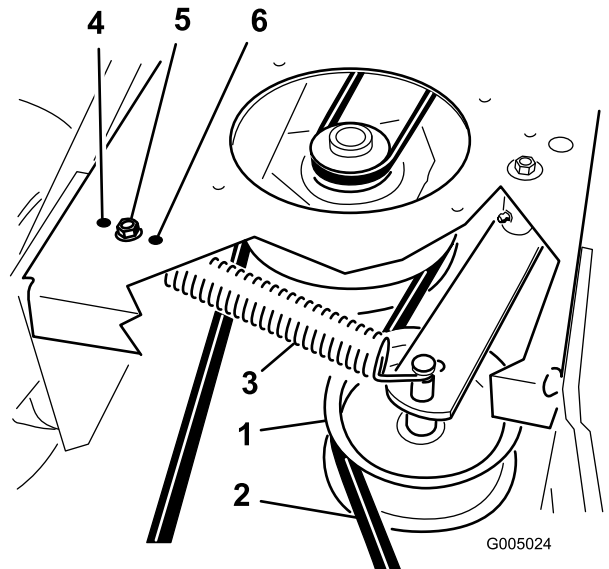


Figure 54

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

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 55). If the edges are not sharp or have nicks, remove and sharpen the blades. Refer to Sharpening the Blades.

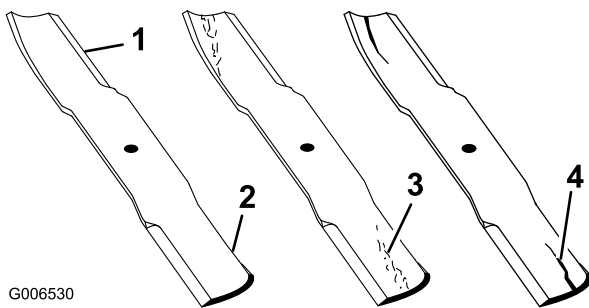


Figure 55

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

2. Inspect the blades, especially the curved area (Figure 55). If you notice any cracks, wear, or a slot forming in this area (item 3. in Figure 55), 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.
4. Measure from a level surface to the cutting edge, position A, of the blades (Figure 56).

Note: Note this dimension. For 36 inch mower decks use Figure 57.

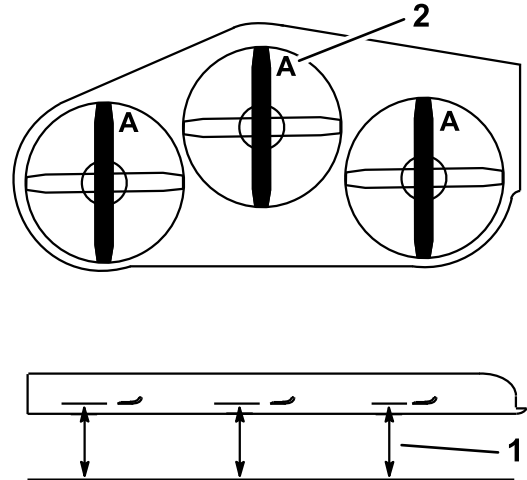


Figure 56

48 inch Mower Deck shown

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

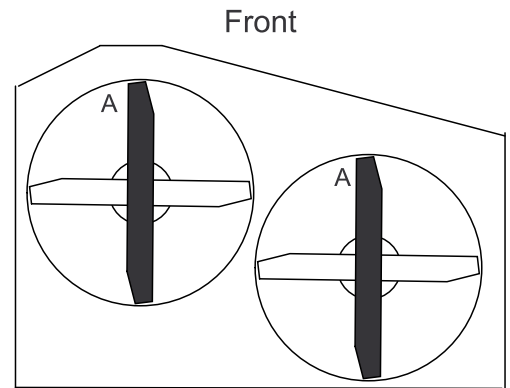


Figure 57

36 inch Mower Deck shown

5. Rotate the opposite ends of the blades forward.
6. Measure from a level surface to the cutting edge of the blades at the same position as in step 4 above.

Note: The difference between the dimensions obtained in steps 4 and 5 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 and Installing the Blades.

⚠ 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 58).

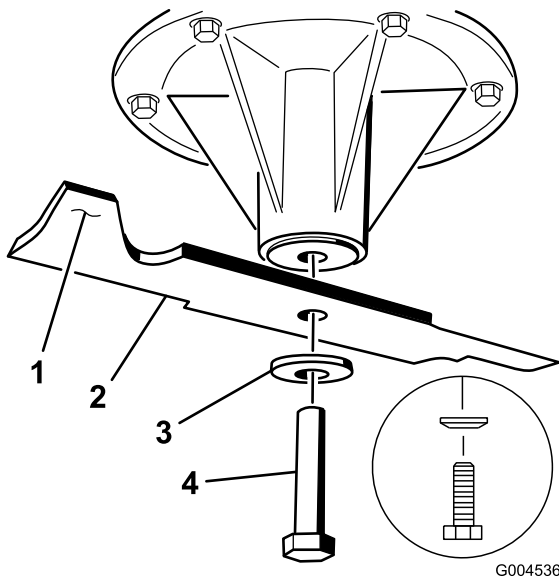


Figure 58

48 inch Mower Decks

1. Sail Area of Blade
2. Blade
3. Curved washer
4. Blade Bolt

3. For 36 inch mower decks, remove the blade bolt, curved washer, blade stiffener, and blade from the spindle shaft (Figure 59).

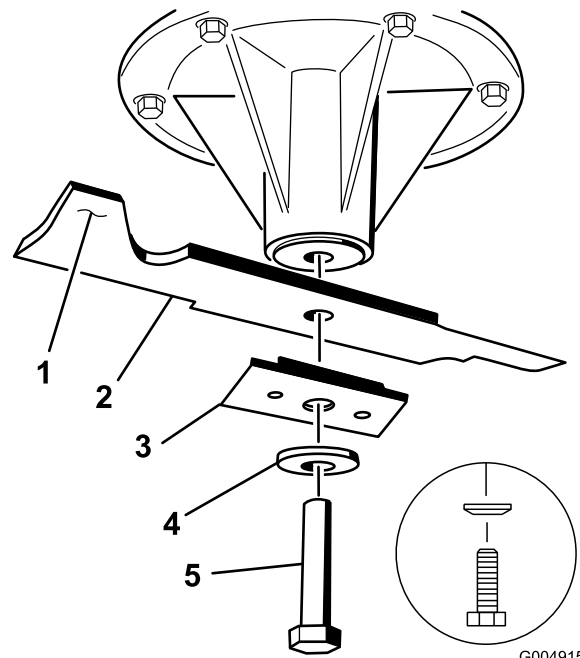


Figure 59

36 inch Mower Decks

1. Sail Area of 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 60).

Note: Maintain the original angle. The blade retains its balance if the same amount of material is removed from both cutting edges.

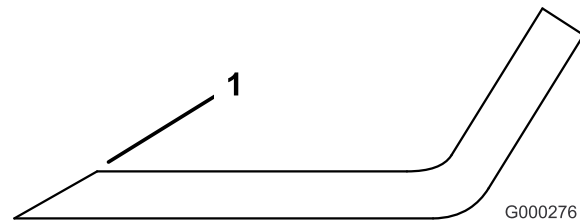


Figure 60

1. Sharpen at original angle
 2. Check the balance of the blade by putting it on a blade balancer (Figure 61).
 3. If the blade stays in a horizontal position, the blade is balanced and can be used.
- Note:** If the blade is not balanced, file some metal off the end of the sail area only (Figure 58).
4. Repeat this procedure until the blade is balanced.

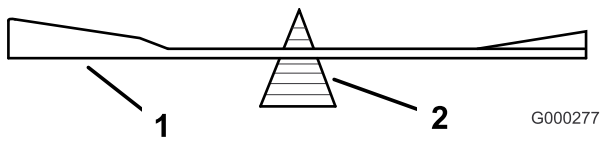


Figure 61

1. Blade
2. Balancer

Installing the Blades

1. Install the blade onto the spindle shaft (Figure 58).
 - Important:** The sail part of the blade must be pointing upward, toward the inside of the mower to ensure proper cutting (Figure 58).
2. For 48 inch mower decks, install the blade, curved washer, and blade bolt (Figure 58).
3. For 36 inch mower decks, install the blade, stiffener, curved washer, and blade bolt (Figure 59).
4. Torque the blade bolt to 115-140 N-m (85-110 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 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 the specifications.
5. Check that the blades and spindle shafts are not bent. Refer to Checking for Bent Blades.
6. Set the height-of-cut to the 101.6 mm (4 inch) position. Refer to Adjusting the Height-Of-Cut.
7. Perform the steps in the following sections: Frame Set Up, Checking Front-to-Rear Pitch, and Checking Side-to-Side Leveling.

Frame Set Up

Checking the Carrier Frame and 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 62.
4. At the carrier frame cross channel, measure the height at location **A** (Figure 62).

Note: This measurement should be 33 mm (1-5/16 inch), plus or minus 6 mm (1/4 inch).

5. If the height at location **A** is not 33 mm (1-5/16 inch), an adjustment is needed.
6. Loosen the carrier frame mounting bolts on both sides of the machine (Figure 62).
7. Align the carrier frame and engine deck to match 33 mm (1-5/16 inch), plus or minus 6 mm (1/4 inch) at location **A** (Figure 62).
8. Tighten the carrier frame mounting bolts on both sides of the machine.

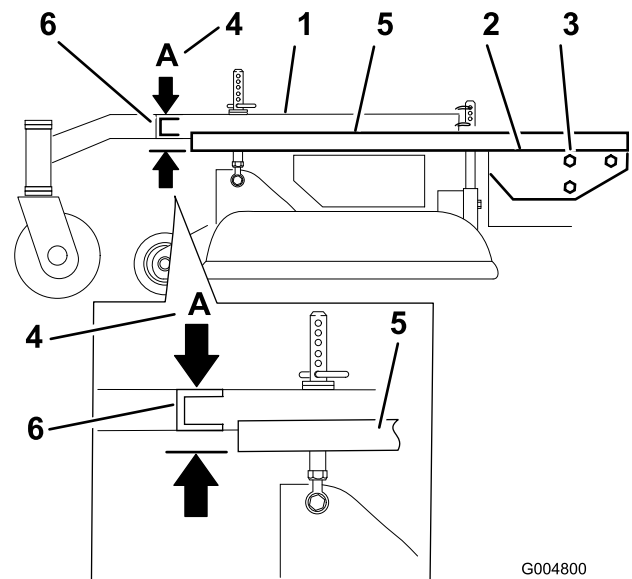


Figure 62

1. Carrier frame
2. Top of engine deck
3. Carrier frame mounting bolts
4. Location A, 33 mm (1-5/16 inch), plus or minus 6 mm (1/4 inch)
5. Straight edge
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 Drive System Maintenance (page 28).
4. Measure the engine deck height at location **A** (Figure 63).

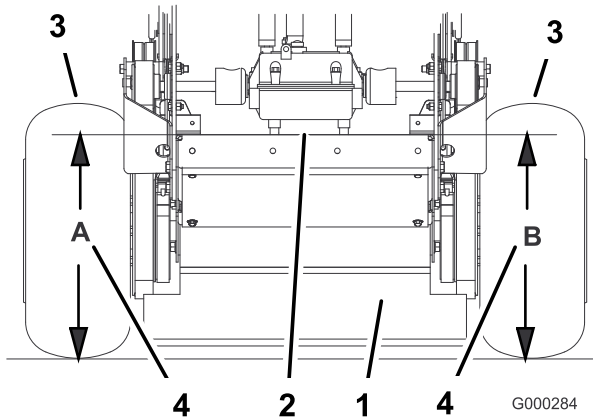


Figure 63

- | | |
|-------------------------|---|
| 1. Back view of machine | 3. Tires |
| 2. Top of engine deck | 4. Same height at locations A and B |
5. Measure the engine deck height at location **B** (Figure 63).
 6. If the height at location **A** and **B** are not the same, change tire pressure slightly to make them the same.

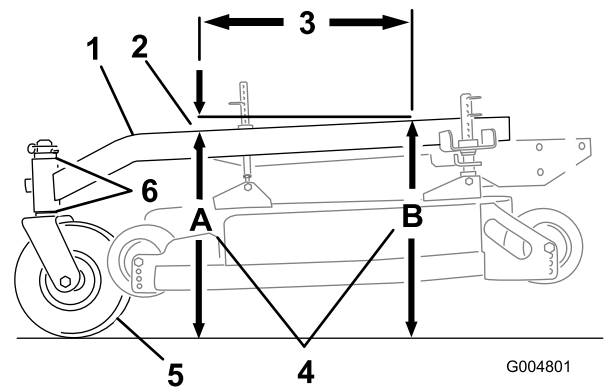


Figure 64

- | | |
|---|--|
| 1. Carrier frame | 4. Height at locations A and B |
| 2. 6-10 mm (1/4-3/8 inch) pitch over 61 cm (24 inch) length | 5. Caster wheel |
| 3. 61 cm (24 inches) | 6. Caster spacers |
2. Measure carrier frame height at location **A** (Figure 64).
 3. Measure carrier frame height at location **B** (Figure 64).
 4. The height at location **A** must be a 6 mm -10 mm (1/4-3/8 inch) lower than location **B** (Figure 64).
 5. If the carrier frame is not correct, move caster spacers to make it a 6 mm -10 mm (1/4-3/8 inch) pitch (Figure 64).

Note: Move the spacers from the top or bottom to make the correct pitch.

6. The tire pressure may also be adjusted slightly to make a 6 mm (1/4 inch) pitch.

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 64).

1. Measure out 61 cm (24 inches) on the carrier frame (Figure 64).

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 Drive System Maintenance (page 28) .
4. Measure carrier frame height at location **A** (Figure 65).
5. Measure carrier frame height at location **B** (Figure 65).
6. If the carrier frame height is not the same move spacers from top or bottom of caster wheel, to make it level. The tire pressure may also be adjusted slightly to make it level.

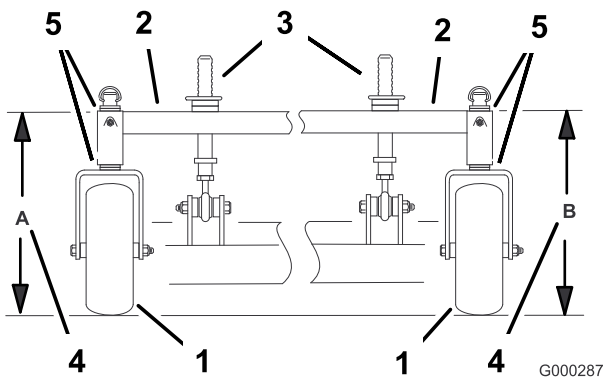


Figure 65

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

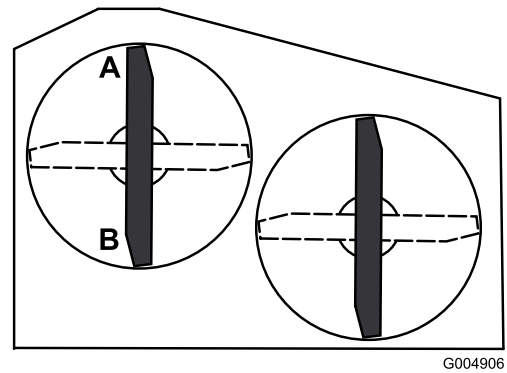


Figure 67

36 inch Mower Deck shown

Checking the Mower Deck Front-to-Rear Pitch

1. Adjust the tire pressure in the rear tires to specifications; refer to Drive System Maintenance (page 28) .
2. Position 1 blade front-to-rear. Measure at **A** and **B** locations from a level surface to the cutting edge of the blade tips (Figure 66 or Figure 67).

Note: For 36 inch mower decks use Figure 67.

3. The mower blade should be a 6 mm (1/4 inch) lower in front at **A** than in the rear at **B**.
4. Rotate blades and repeat for other blades.
5. If it is not correct, proceed to Changing the Deck Front-to-Rear Pitch.

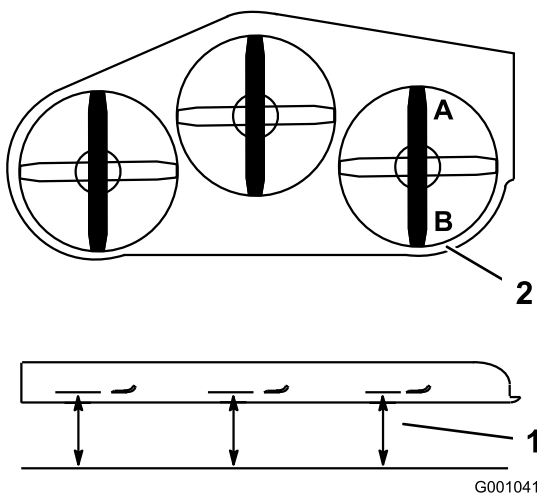


Figure 66

48 inch Mower Deck shown

- | | |
|--|---------------------------------|
| 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 68).

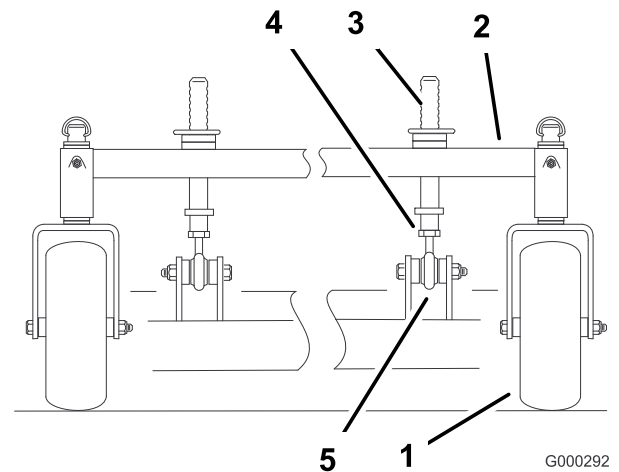


Figure 68

- | | |
|-----------------------------|---------------|
| 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 68).
 3. To lower the front of the deck, loosen the jam nut and rotate the front pin counter clockwise (Figure 68).
 4. Position the blades front-to-rear.
 5. Measure at C and D locations (Figure 66) 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 68).

Checking the Mower Deck Side-to-Side Height

1. Adjust the rear tire pressure to specifications; refer to Drive System Maintenance (page 28) .
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 69).
4. For 36 inch mower decks use Figure 70.

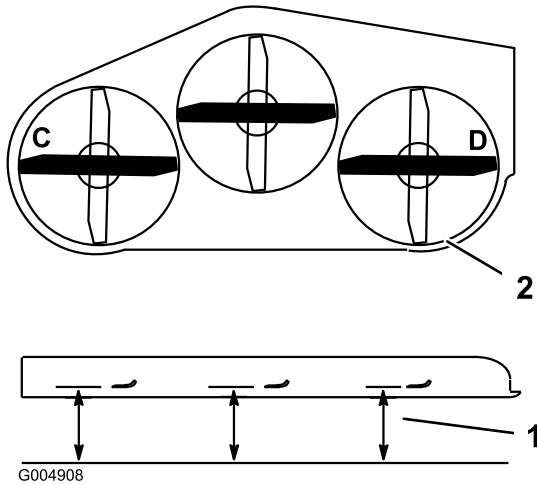


Figure 69

48 inch Mower Deck shown

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

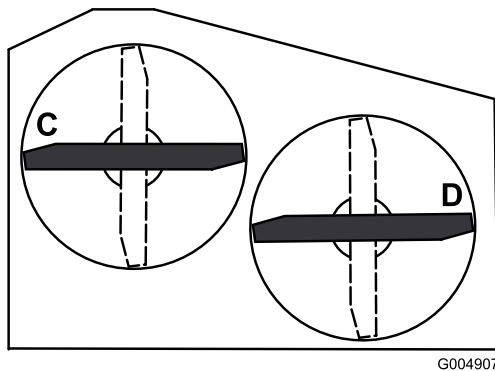


Figure 70

36 inch Mower Deck shown

5. 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 caster spacers.

1. Change the rear tire pressure.

Note: Do this to the corresponding side that needs adjustment.

2. Adjust the caster spacer.
3. Recheck the front-to-rear pitch and side to side leveling of the cutting unit.

Matching Height-of-Cut

1. Check the rear tire pressure.
2. Set the height-of-cut to the 101.6 mm (4 inch) position following the height-of-cut decal.
3. With the machine on level surface, position one blade front-to-rear.
4. Measure at **A** and from level surface to the cutting edge of the blade tips (Figure 71).
5. For 36 inch mower decks use Figure 72.

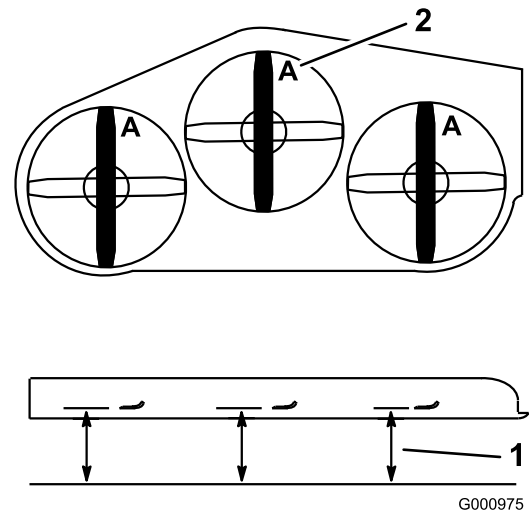


Figure 71

48 inch Mower Deck shown

1. Measure from a level surface
2. Measure blade at point **A**

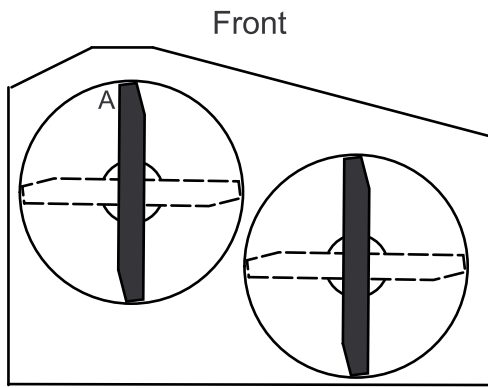


Figure 72

36 inch Mower Deck shown

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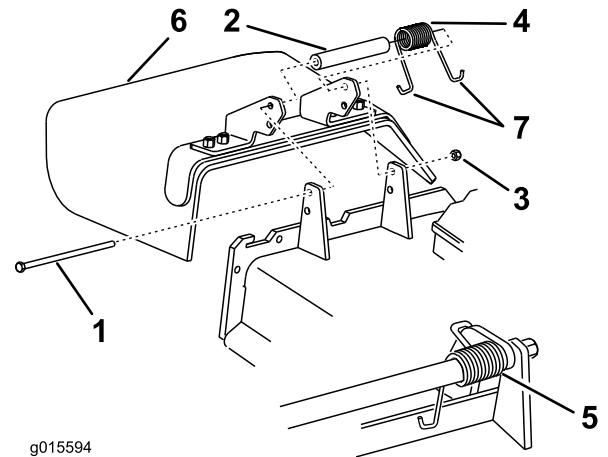


Figure 73

g015594

6. The measurement should be 101.6 mm (4 inch).
7. 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.
8. Check the carrier frame front-to-rear pitch.

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

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 73). Remove the damaged or worn grass deflector.

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

Note: Make sure that one **J** end of the spring is installed behind the deck edge before installing the bolt as shown in Figure 73.

3. Install the bolt and nut. Place one **J** hook end of the spring around the grass deflector (Figure 73).

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.

Storage

Cleaning and Storage

1. Disengage the power take off (PTO), set the parking brake, and turn the ignition key to off. Remove the key.
2. Remove grass clippings, dirt, and grime from the external parts of the entire machine, especially the engine. Clean dirt and chaff from the outside of the engine's cylinder head fins and 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 shift lever plate, and engine.
3. Check the brake; refer to Servicing the Brake in Brake Maintenance (page 32).
4. Service the air cleaner; refer to Servicing the Air Cleaner in Engine Maintenance (page 23).
5. Grease the machine; refer to Greasing and Lubrication in Lubrication (page 22).
6. Change the engine oil; refer to Servicing the Engine in Engine Maintenance (page 23).
7. Check the tire pressure; refer to Checking the Tire Pressure in Drive System Maintenance (page 28).
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 Servicing the Fuel Tank in Fuel System Maintenance (page 27), 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 Plug in Engine Maintenance (page 23). 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.

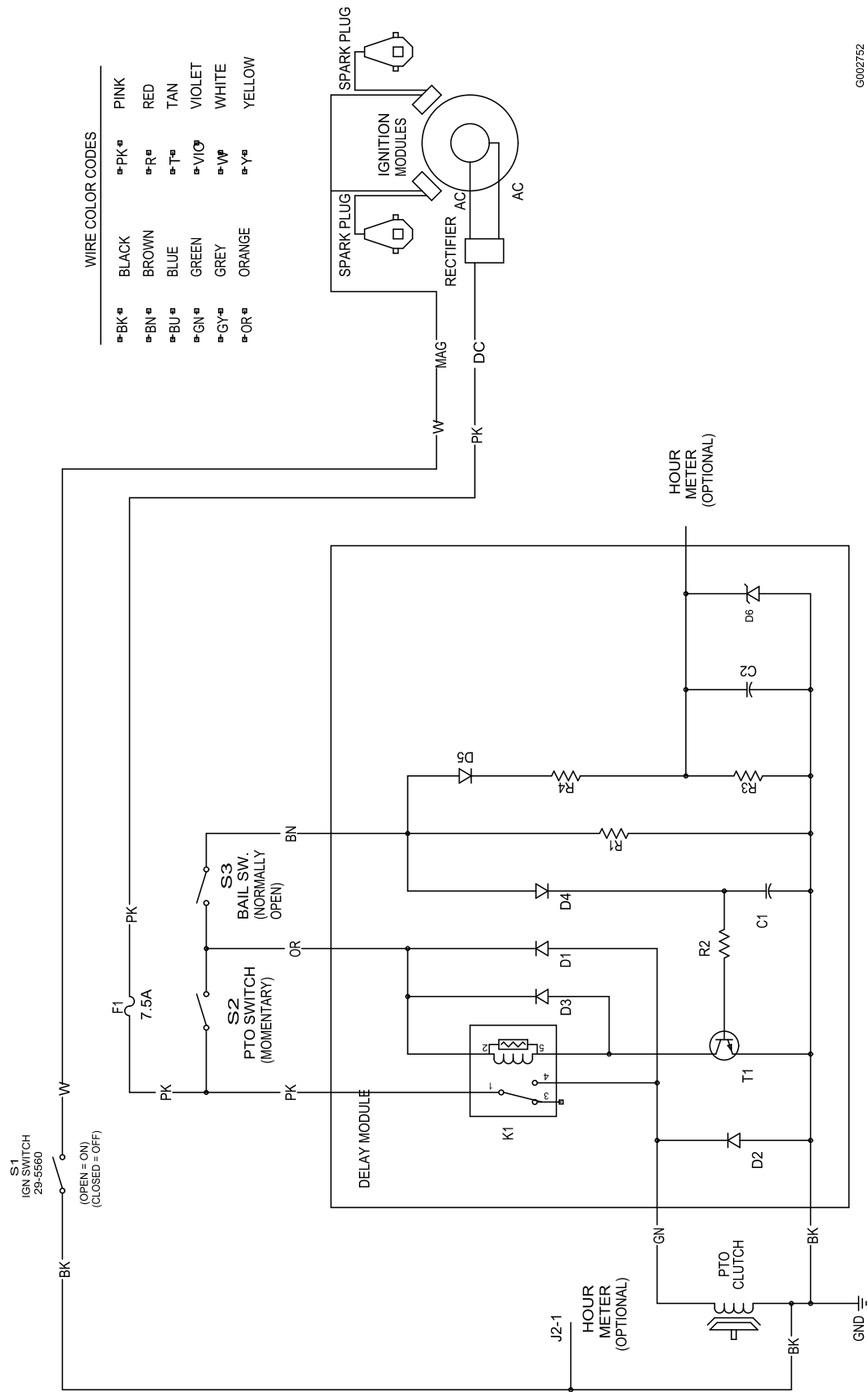
Troubleshooting

Problem	Possible Cause	Corrective Action
The starter does not crank.	<ol style="list-style-type: none"> 1. The blade control switch (PTO) is engaged. 2. The parking brake is not on. 3. The drive levers are not in neutral lock position. 4. The operator is not seated. 5. The battery is dead. 6. The electrical connections are corroded or loose. 7. The fuse is blown. 8. The relay or switch is defective. 	<ol style="list-style-type: none"> 1. Move the blade control switch (PTO) to disengaged. 2. Set the parking brake. 3. Ensure that the drive levers are in the neutral lock position. 4. Sit on the seat. 5. Charge the battery. 6. Check the electrical connections for good contact. 7. Replace the fuse. 8. Contact an Authorized Service Dealer.
The engine will not start, starts hard, or fails to keep running	<ol style="list-style-type: none"> 1. The fuel tank is empty. 2. The fuel shutoff valve is closed. 3. The oil level in the crankcase is low. 4. The throttle is not in the correct position. 5. There is dirt in fuel filter. 6. There is dirt, water, or stale fuel is in the fuel system. 7. The air cleaner is dirty. 8. The seat switch is not functioning properly. 9. The electrical connections are corroded, loose or faulty. 10. The relay or switch is defective. 11. The spark plug is faulty. 12. The spark plug wire is not connected. 	<ol style="list-style-type: none"> 1. Fill the fuel tank. 2. Open the fuel shutoff valve. 3. Add oil to the crankcase. 4. Be sure that the throttle control is midway between the "SLOW" and "FAST" positions. 5. Replace the fuel filter. 6. Contact an Authorized Service Dealer. 7. Clean or replace the air cleaner element. 8. Check the seat switch indicator. Replace the seat if needed. 9. Check the electrical connections for good contact. Clean the connector terminals thoroughly with electrical contact cleaner, apply dielectric grease, and reconnect. 10. Contact an Authorized Service Dealer. 11. Clean, adjust, or replace spark plug. 12. Check the spark plug wire connection.
The engine loses power.	<ol style="list-style-type: none"> 1. The engine load is excessive. 2. The air cleaner is dirty. 3. The oil level in the crankcase is low. 4. The cooling fins and air passages above the engine are plugged. 5. The vent hole in the fuel cap is plugged. 6. There is dirt in the fuel filter. 7. There is dirt, water, or stale fuel is in the fuel system. 	<ol style="list-style-type: none"> 1. Reduce the ground speed. 2. Clean the air cleaner element. 3. Add oil to the crankcase. 4. Remove the obstruction from the cooling fins and air passages. 5. Clean or replace the fuel cap. 6. Replace the fuel filter. 7. Contact an Authorized Service Dealer.
The engine overheats.	<ol style="list-style-type: none"> 1. The engine load is excessive. 2. The oil level in the crankcase is low. 3. The cooling fins and air passages above the engine 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 mower pulls left or right (with levers fully forward)	<ol style="list-style-type: none"> 1. The tracking needs adjustment 2. The tire pressure in drive tires not correct. 	<ol style="list-style-type: none"> 1. Adjust the tracking. 2. Adjust tire pressure in the drive tires.

Problem	Possible Cause	Corrective Action
The machine does not drive.	<ol style="list-style-type: none"> 1. The by pass valves is not closed tight. 2. The pump belt is worn, loose or broken. 3. The pump belt is off a pulley. 4. The idler sprint is broken or missing. 5. The hydraulic oil level is low or too hot. 	<ol style="list-style-type: none"> 1. Tighten the by pass valves. 2. Change the belt. 3. Change the belt. 4. Replace the spring. 5. Add hydraulic oil to reservoirs or let it cool down.
The machine vibrates abnormally.	<ol style="list-style-type: none"> 1. The cutting blade(s) is/are bent or unbalanced. 2. The blade mounting bolt is loose. 3. The engine mounting bolts are loose. 4. The engine pulley, idler pulley, or blade pulley is loose. 5. The engine pulley is damaged. 6. The blade spindle is bent. 7. The motor mount is loose or worn. 	<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. 7. Contact an Authorized Service Dealer.
Mowing is resulting in uneven cutting height.	<ol style="list-style-type: none"> 1. The blade(s) not sharp. 2. The cutting blade(s) is/are bent. 3. The mower deck is not level. 4. The underside of mower is dirty. 5. The tire pressure is not correct. 6. The blade spindle bent. 	<ol style="list-style-type: none"> 1. Sharpen the blade(s). 2. Install new cutting blade(s). 3. Level the mower deck from side-to-side and front-to-rear. 4. Clean the underside of the mower. 5. Adjust the tire pressure. 6. Contact an Authorized Service Dealer.
The blades do not rotate.	<ol style="list-style-type: none"> 1. The mower deck belt is worn, loose or broken. 2. The mower deck belt is off pulley. 3. The pump drive belt is worn, loose or broken. 4. The idler spring is broken or missing. 	<ol style="list-style-type: none"> 1. Install a new deck belt. 2. Install the mower deck pulley and check the idler pulley, idler arm, and spring for correct position and function. 3. Check the belt tension or install a new belt. 4. Replace the spring.
The clutch will not engage.	<ol style="list-style-type: none"> 1. The fuse is blown. 2. There is low voltage supply at the clutch. 3. The coil is damaged. 4. There is inadequate current supply. 5. The rotor/armature airgap is too large. 	<ol style="list-style-type: none"> 1. Replace the fuse. Check coil resistance, battery charge, charging system, and wiring connections and replace if necessary. 2. Check coil resistance, battery charge, charging system, and wiring connections and replace if necessary. 3. Replace the clutch. 4. Repair or replace the clutch lead wire or electrical system. Clean the connector contacts. 5. Remove the shim or replace the clutch.

Schematics

KAWASAKI GEAR M.S.



WIRE COLOR CODES

■BK■	■PK■	■PK■	■PK■
■BN■	■R■	■R■	■R■
■BU■	■T■	■T■	■T■
■GN■	■V■	■V■	■V■
■GY■	■W■	■W■	■W■
■OR■	■Y■	■Y■	■Y■

Electrical Schematic (Rev. A)

G002752

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
• Engines ⁴	3 years
• Frame	Lifetime (original owner only) ³
Z Master® 2000 Series Mowers	4 years or 500 hours ²
• Engines ⁴	3 years
• Frame	Lifetime (original owner only) ³
Z Master® 3000 Series Mowers	5 years or 1,200 hours ²
• Engines ⁴	3 years
• Frame	Lifetime (original owner only) ³
Z Master® 5000 Series Mowers	5 years or 1,200 hours ²
• Engines ⁴	Kohler Command – 2 years Kohler EFI – 3 years
• Frame	Lifetime (original owner only) ³
Z Master® 6000 Series Mowers	5 years or 1,200 hours ²
• Engines ⁴	Kawasaki – 3 years
• Frame	Lifetime (original owner only) ³
Z Master®7000 Series Mowers	5 years or 1,200 hours ²
• Engines ⁴	2 years
• Frame	Lifetime (original owner only) ³
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.