Form No. 3357-636 Rev A

TORO®

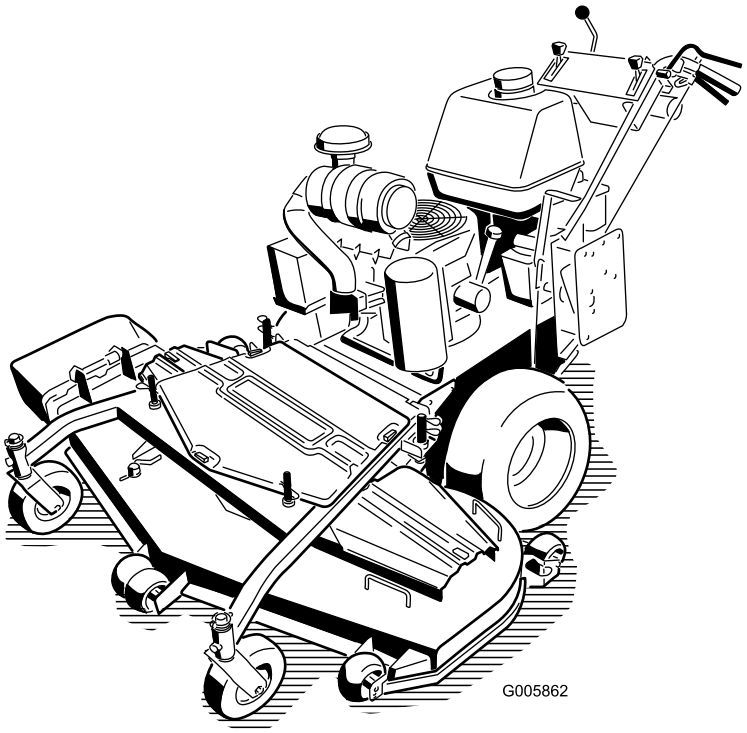
Count on it.

Operator's Manual

# Commercial Walk-Behind Mower

## For Floating Deck, Pistol Grip, Hydro with a 60in TURBO FORCE® Cutting Unit

**Model No. 30280—Serial No. 270000001 and Up**



## Warning

**CALIFORNIA**
**Proposition 65 Warning**

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

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.**

# Introduction

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.

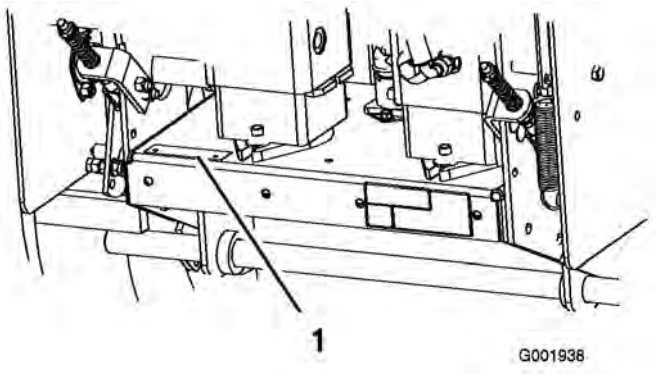



**Figure 1**

1. Location of the model and serial numbers

**Model No.** _____

**Serial No.** _____

This manual identifies potential hazards and has safety messages identified by the following words:

- **Danger** signals an extreme hazard that **will** cause serious injury or death if you do not follow the recommended precautions.
- **Warning** signals a hazard that **may** cause serious injury or death if you do not follow the recommended precautions.
- **Caution** signals a hazard that may cause minor or moderate injury if you do not follow the recommended precautions.

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

# Contents




**8111 Lyndale Avenue South**
**Bloomington, MN 55420**

# 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 from ANSI standard B71.4-2004.

### 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.
- Use extra care when handling gasoline and other fuels. They are flammable and vapors are explosive.
  - Use only an approved container
  - Never remove gas cap or add fuel with engine running. Allow engine to cool before refueling. Do not smoke.
  - Never refuel or drain the machine indoors.
- Check that operator's presence controls, safety switches and shields are attached and functioning properly. Do not operate unless they are functioning properly.

### Operation

- 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.

### 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.

## 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

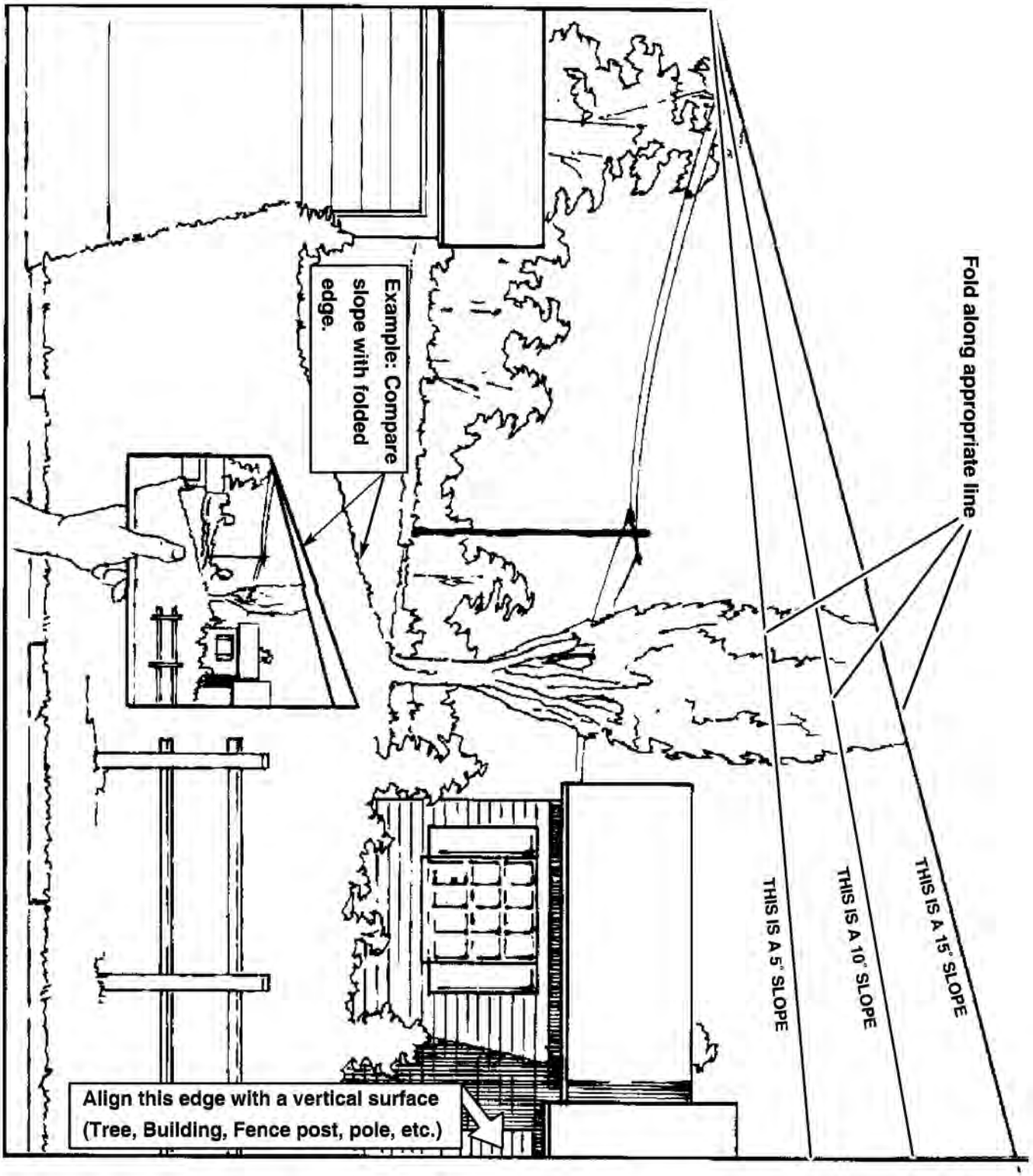
turn over if a wheel goes over the edge of a cliff or ditch, or if an edge caves in.

- 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 15 degrees.

## Service

- Never store the machine or fuel container inside where there is an open flame, such as near a water heater or furnace.
- Keep nuts and bolts tight, especially the blade attachment bolts. Keep equipment in good condition.
- Never tamper with safety devices. Check safety systems for proper operation before each use.
- Use only genuine replacement parts to ensure that original standards are maintained.
- Check brake operation frequently. Adjust and service as required.

# Slope Chart


Fold along appropriate line
THIS IS A 15° SLOPE
THIS IS A 10° SLOPE
THIS IS A 5° SLOPE
Example: Compare slope with folded edge.
Align this edge with a vertical surface
(Tree, Building, Fence post, pole, etc.)

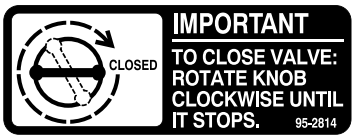
# Safety and Instructional Decals

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.


**1-523552**


**68-8340**


**43-8480**




**95-2814**


**98-0776**


**66-1340**


**98-4387**

1. Warning—wear hearing protection.


**98-5954**


**Battery Symbols**

Some or all of these symbols are on your battery

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

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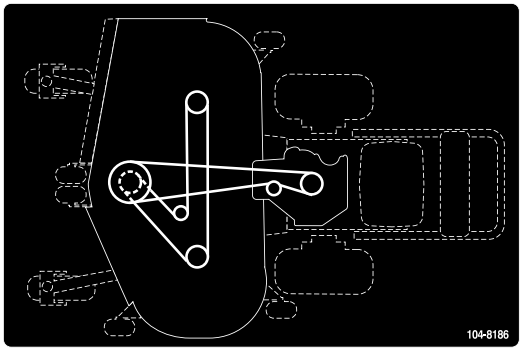


**104-8186**

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**106-0635**

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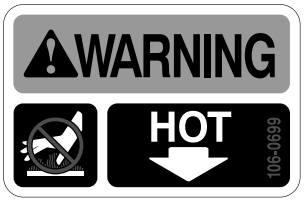


**106-0699**

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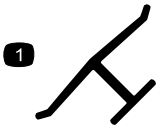


**Manufacturer's Mark**

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

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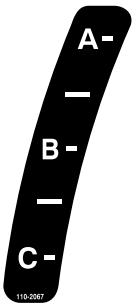


**110-2067**

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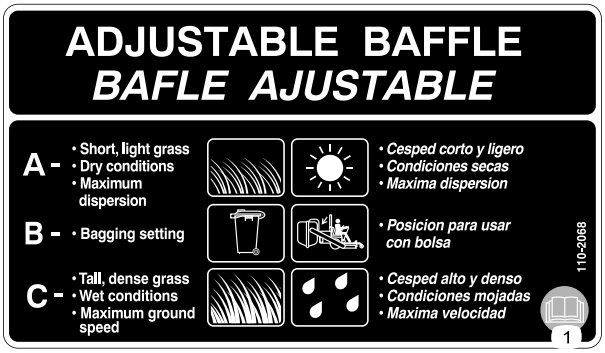


**110-2068**

1. Read the *Operator's Manual*.

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**112-8720**

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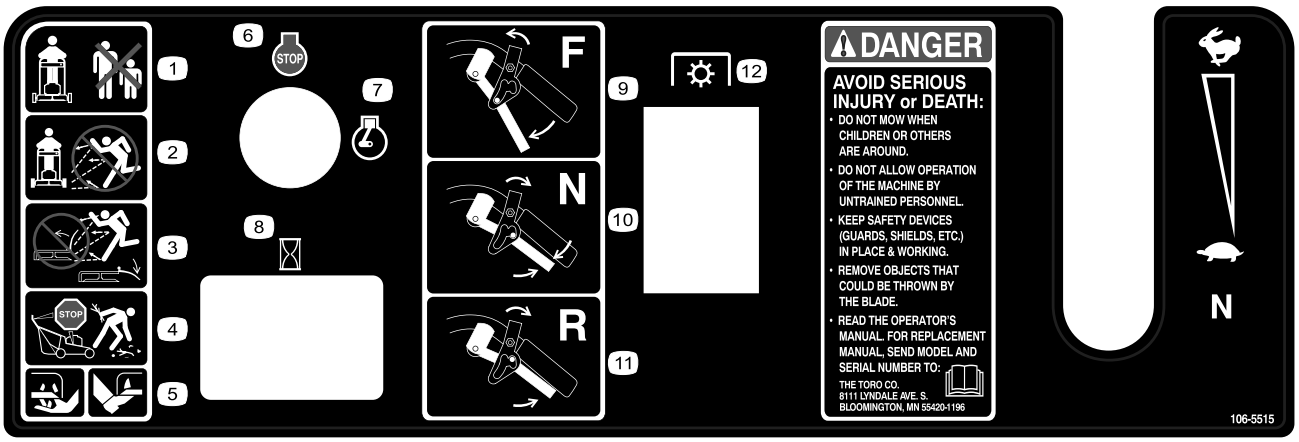



**106-5515**

1. Keep bystanders a safe distance from the machine.
2. Do not allow bystanders to be hit by thrown objects.
3. Do not operate the mower with the deflector up or removed.
4. Stop the engine and pick up debris before operating.
5. Mower can cut hands or feet.
6. Engine—stop
7. Engine—run
8. Hour meter
9. To park, squeeze the drive levers and rotate the neutral locks forward.
10. To drive, rotate the neutral locks and slowly release the drive levers.
11. To place the machine in neutral, squeeze the drive levers and rotate the neutral locks backward.
12. Power take-off (PTO)


**110-4953**

1. Fast
2. Continuous variable setting
3. Slow
4. Choke

# Product Overview

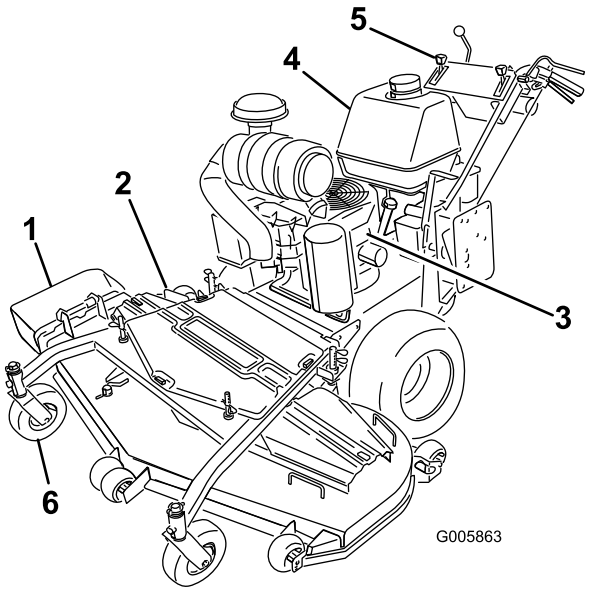



**Figure 2**

1. Side discharge chute
2. Mower deck
3. Engine
4. Gas tank
5. Controls
6. Front caster

## Controls

Become familiar with all the controls (Figure 3) before you start the engine and operate the machine.

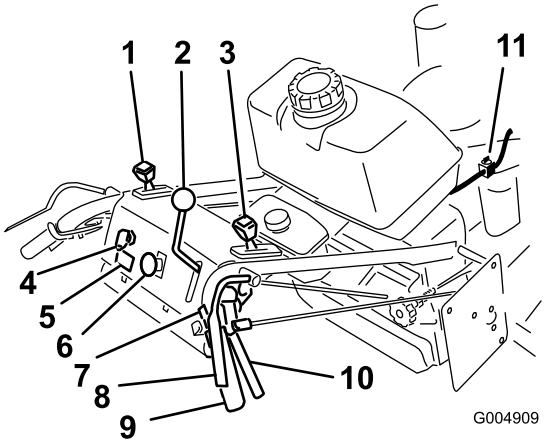



**Figure 3**

1. Throttle control
2. Speed control lever
3. Choke
4. Ignition switch
5. Hour meter
6. Blade control switch (PTO)
7. Neutral lock
8. Operator Presence Control levers (OPC)
9. Handle
10. Drive Lever
11. Fuel shut-off valve

### Throttle Control

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

### Choke

Use the choke to start a cold engine.

### Operator Presence Control (OPC) Levers

When you squeeze the OPC levers against the handles, the OPC system senses that the operator is in the normal operating position. When you release the OPC levers, the OPC system senses that the operator has left the normal operating position, and the system will stop the engine if either the speed control lever is not in the **neutral** position or the blade control (PTO) switch is engaged.

### Blade Control Switch (PTO)

The blade control switch (PTO) is used to engage the electric clutch to drive the mower blades with the OPC levers pressed against the handles. Pull the switch up to engage the blades. To disengage the blades, briefly release the OPC levers.

### Ignition Switch

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

### Speed Control Lever

This machine has a variable speed control with a neutral position. This controls how fast or slow the machine will travel forward.

### Drive Levers

Release drive levers to engage forward traction operation and squeeze the levers until an increase in force is felt to go into neutral position and continue to squeeze to go in reverse. Squeeze right side of drive lever to turn right and left side to turn left.

### Neutral Lock

Squeeze drive levers back until an increase in force is felt and move locks to the rear for neutral lock.

### Fuel Shut-off Valve

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

### Hour Meter

Shows the total hours the machine has been operated. This operates only when the mower blades are operating.

The hour meter will flash 3 hours before and after a service interval. The service intervals are set for the first 8 hours, every 100 hours there after, and every 400 hours.

**Note:** Make sure maintenance is done at all recommended intervals shown in the Recommended Maintenance Schedule.

### Attachments/Accessories

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

## Specifications

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

60 inch mowers:

| | |
|---|---|
| Width with deflector down | 76–5/8 inches (192 cm) |
| Length | 85–3/4 inches (218 cm) |
| Height with handle in lowest position | 41–1/2 inches (106 cm) |
| Weight | 780 lb (354 kg) |

# Operation

## Adding Fuel

Use **Unleaded** Regular Gasoline suitable for automotive use (85 pump octane minimum). Leaded regular gasoline may be used if unleaded regular is not available.

**Important: Never use methanol, gasoline containing methanol, or gasohol containing more than 10% ethanol because the fuel system could be damaged. Do not mix oil with gasoline.**

**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 1/4 to 1/2 inch (6 to 13 mm) 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.**

**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.**

**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 opening.**
- **Keep gas away from eyes and skin.**

### 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 fuel tank cap and remove the cap. Add unleaded regular gasoline to fuel tank, until the level is 1/4 to 1/2 inch (6 to 13 mm) below the bottom of the filler neck. This space in the tank allows gasoline to expand. Do not fill the fuel tank completely full.
3. Install 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.

**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.

**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 4**

1. Warning—wear hearing protection.

## Operating the Parking Brake

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

If the parking brake does not hold securely, adjust it. Refer to Servicing the Parking Brake.

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

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

### Setting the Parking Brake

Pull the parking brake lever rearward (Figure 5).

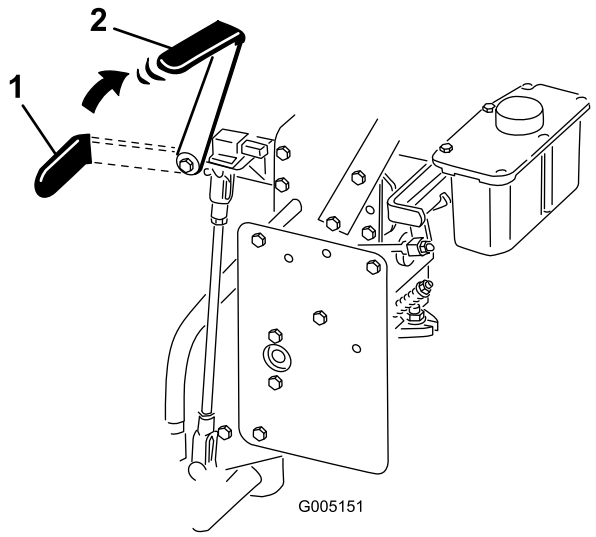



**Figure 5**

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

### Releasing the Parking Brake

Push the parking brake lever forward.

## Starting and Stopping the Engine

### Starting the Engine

1. Connect the wires to the spark plugs.
2. Open the fuel valve.
3. Move the speed control lever to neutral.
4. Set the neutral locks.
5. Set the parking brake.
6. Move the throttle control to fast and move the choke lever to the on position before starting a cold engine (Figure 6).

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

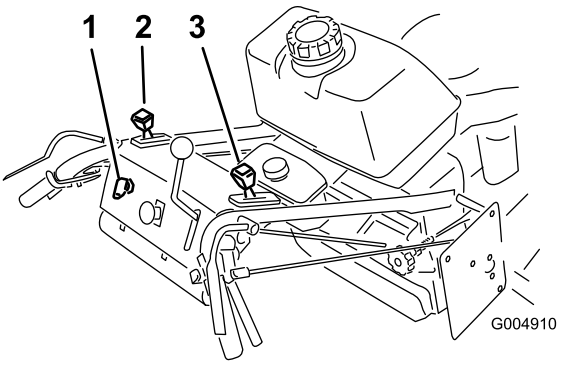



**Figure 6**

1. Ignition switch
2. Throttle lever
3. Choke

7. Turn the ignition key to the start position to energize the starter. When the engine starts, release the key.

   **Note:** Do not engage the starter for more than 5 seconds at a time. If the engine fails to start, allow for a 15 second cool-down period between attempts. Failure to follow these instructions can burn out the starter motor.
8. When engine starts, move the throttle control between the fast and slow position and move the choke lever to the off position. Allow the engine to warm up and then move the throttle control to the fast position.

### Stopping the Engine

1. Move drive levers to neutral and set neutral locks.
2. Move the throttle lever to slow (Figure 6).
3. Move the speed control lever to neutral and release the OPC levers to disengage the mower.
4. If the engine has been working hard or is hot, let the engine idle for 30 to 60 seconds before turning the engine off.
5. To stop the engine, turn the ignition key to off.

   **Important: Make sure fuel shut off valve is closed before transporting or storing machine, as fuel leakage may occur. Before storing machine, pull wire off spark plug(s) to prevent possibility of accidental starting.**

## Operating the Neutral Locks

Always set the neutral lock when you stop the machine. Set the parking brake if it is left unattended.

### Setting the Neutral Lock

1. Squeeze the drive levers back until an increase in force is felt.
2. Place thumbs on the upper part of the locks and move them back (Figure 7).

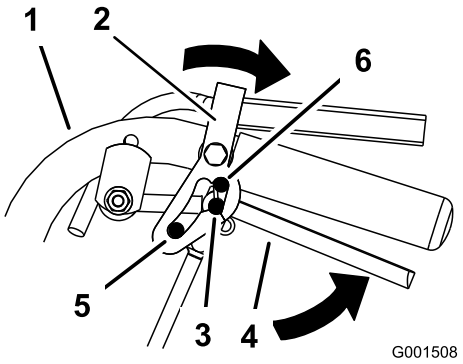



**Figure 7**

1. Handle
2. Neutral lock
3. Neutral position
4. Drive lever
5. Full speed forward position
6. Reverse position

### Releasing the Neutral Lock

1. Squeeze the drive levers back until an increase in force is felt.
2. Place thumbs on the upper part of locks and move them forward until the pins are in the forward slot (Figure 8).

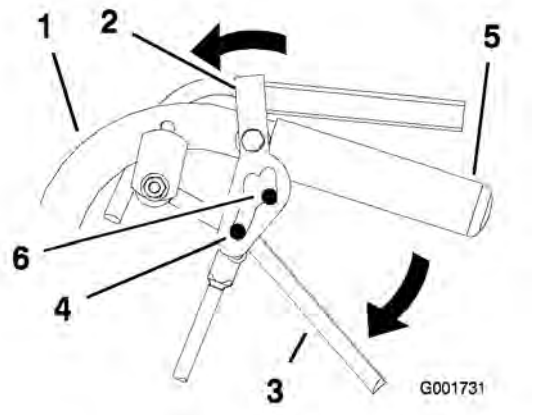



**Figure 8**

1. Handle
2. Neutral lock
3. Drive lever
4. Pin in full speed forward position
5. Handle
6. Forward slot

## Operating the Mower Blade Control (PTO)

The blade control knob (PTO) is used in conjunction with the Operator Presence Control (OPC) levers to engage and disengage the mower blades.

### Engaging the Mower Blades (PTO)

1. To engage blades, squeeze the Operator Presence Control (OPC) levers against handle grips (Figure 9).
2. Pull the blade switch (PTO) up and release it while holding the OPC levers against handle grip.

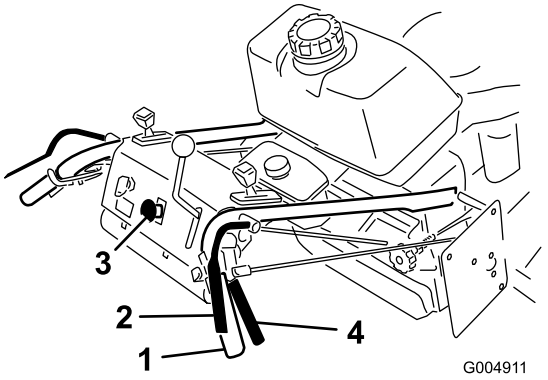



**Figure 9**

1. Handle
2. Operator Presence Control levers (OPC)
3. Blade control switch (PTO)
4. Drive Lever

### Disengaging the Mower Blades (PTO)

Release the Operator Presence Control (OPC) levers to stop the blades (Figure 9).

**Note:** The engine will kill if the OPC levers are released with the mower running and the speed control lever is not in neutral position.

# The Safety Interlock System

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

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

### Understanding the Safety Interlock System

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

- The blade control switch (PTO) is off.
- The speed control lever is in neutral.

The safety interlock system is designed to kill the engine when:

- The Operator Presence Control (OPC) levers are released with the mower engaged and/or the speed control is out of neutral.
- The speed control lever is shifted out of neutral without holding OPC levers or with the brake engaged.
- The blade control switch (PTO) is pulled up without holding the OPC levers.

### Testing the Safety Interlock System

Test the safety interlock system before you use the machine each time. If the safety system does not operate as described, have an Authorized Service Dealer repair the safety system immediately.

**While testing the safety interlock system, the machine may move forward and cause personal injury or property damage.**

- **Perform the safety interlock test in an open area.**
- **Ensure no one is standing in front of the machine while performing the safety interlock test.**

1. Set the neutral locks and place speed control lever in neutral. Start the engine; refer to Starting and Stopping the Engine.
2. Without holding the Operator Presence Control (OPC) levers, pull the blade control knob (PTO) up. The engine should kill.
3. With engine running, hold down the OPC levers. Pull the blade control switch (PTO) up. The drive belt should engage and the mower blades begin rotating.
4. Release the OPC levers. The engine should kill.
5. With the engine running, move the speed control lever forward. Release the OPC levers. The engine should kill.
6. With the engine running, set the parking brake and hold down the OPC levers. Move the speed control lever forward. The engine should kill.
7. If all the above conditions are not met have an Authorized Service Dealer repair the safety system immediately.

# Driving the Machine Forward and Backward

The throttle control regulates the engine speed as measured in RPM (revolutions per minute). Place the throttle control in the fast position for best performance.

The forward speed of the machine can be increased or decreased by moving the speed control lever while the machine is in motion.

### Driving Forward

1. Release the parking brake.
2. To go forward, move the speed control lever to desired speed.
3. Release the neutral lock. Refer to Releasing the Neutral Lock.
4. Slowly release the drive levers to move forward (Figure 10).

   To go straight, release drive levers equally (Figure 10).

   To turn, squeeze the drive lever on the side and direction you want to turn (Figure 10).

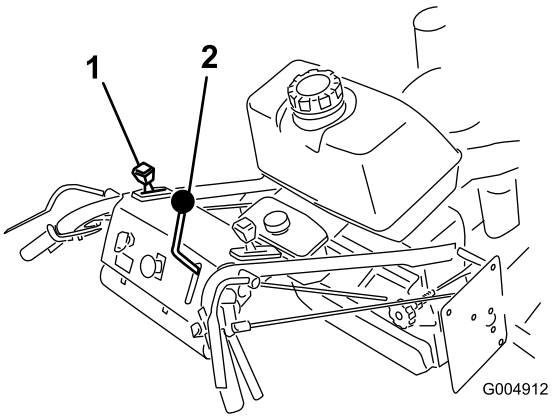



**Figure 10**

1. Drive lever
2. Speed control lever

### Driving Backward

From neutral position, slowly squeeze the drive levers to move rearward (Figure 10).

## Bringing the Machine to the Neutral Position

Always set the neutral lock and parking brake when you stop the machine.

1. Squeeze the drive levers to neutral position.
2. Set the neutral locks. Refer to Operating Neutral Locks.
3. Move speed control lever to neutral position.

   **Note:** The speed control lever can also be used to bring the mower to neutral position and then set the neutral locks.

## Stopping the Machine

1. To stop the machine, squeeze the drive levers to neutral position and engage neutral locks.
2. Move speed control lever into neutral.
3. Stop the engine by turning the ignition key to off.
4. Wait for all moving parts to stop before leaving the operating position. Set the parking brake.

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

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

## Pushing the Machine by Hand

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

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

### To Push the Machine

1. Disengage the PTO, move the motion control levers to the neutral locked position and set the parking brake.
2. Open the by-pass valve on both pumps by turning them counter clockwise 1 to 2 turns. This allows hydraulic fluid to by-pass the pumps and the wheels to turn (Figure 11).

   **Note:** Rotate the by-pass valves a maximum of 2 turns so the valve does not come out of the body causing fluid to run out.

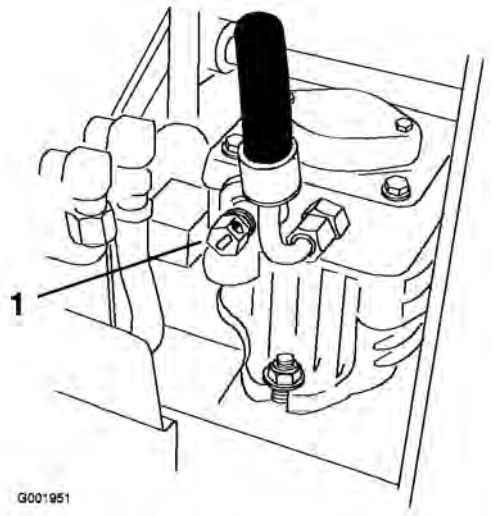



**Figure 11**

1. Pump by-pass valve

3. Release the parking brake.

4. Push the machine to the desired location.
5. Set the parking brake.
6. Close the by-pass valves, but do not overtighten them.

   **Important: Do not start or operate the machine with the by-pass valves open. Damage to system may occur.**

## 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 12).

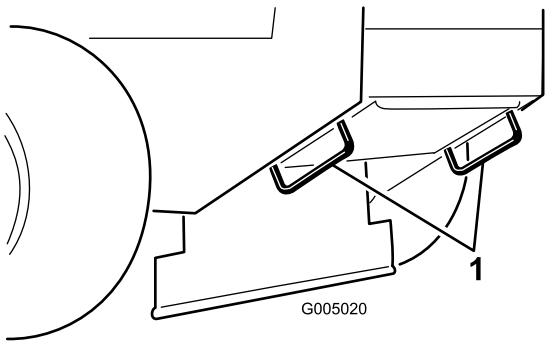



**Figure 12**

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.

**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 1 to 4-1/2 inch (25 to 114 mm) in 1/4 inch (6 mm) increments. Adjustment is done by relocating four hairpin cotter pins in different hole location and by adding or removing spacers.

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

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

1. Select hole in height-of-cut post and number of spacers corresponding to the height-of-cut desired (Figure 13).
2. Using the lift handle, raise side of deck and remove hairpin cotter (Figure 13).
3. Add or remove spacers if needed and then align holes and insert hairpin cotter (Figure 13).

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

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

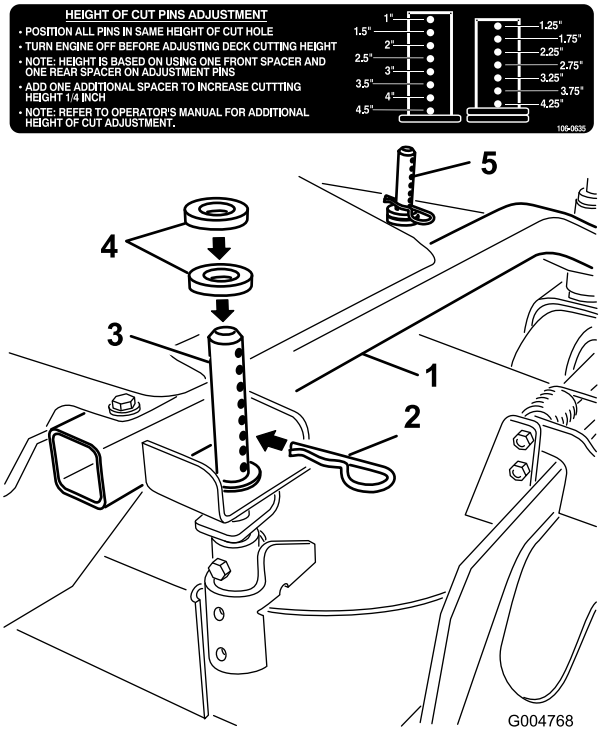



**Figure 13**

1. Carrier Frame
2. Hairpin Cotter
3. Back height-of-cut post
4. Spacers
5. Front height-of-cut post

## 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 3/8 inch (10 mm) minimum clearance above the ground.

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

1. After adjusting height-of-cut, check the anti-scalp rollers so that there is a minimum of 3/8 inch (10 mm) clearance above the ground (Figure 14, Figure 15).
2. If adjustment is needed, remove the bolt, washers and nut (Figure 14, Figure 15).
3. Select a hole position so the anti-scalp rollers are a minimum of 3/8 inch (10 mm) off the ground (Figure 14, Figure 15).
4. Install the bolt and nut (Figure 14, Figure 15).

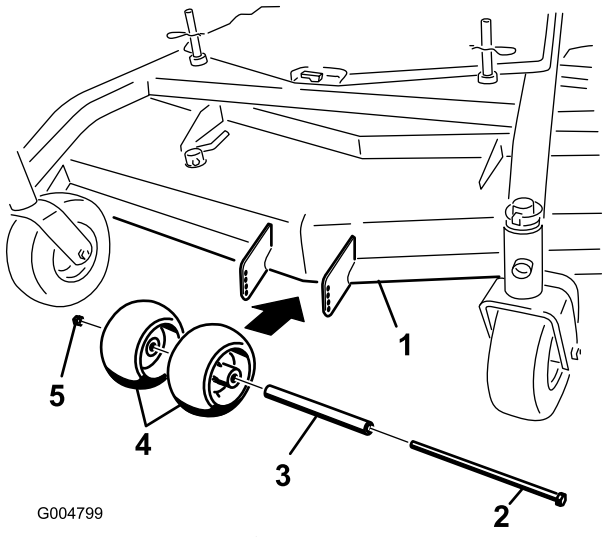



**Figure 14**

1. Mower deck
2. Bolt
3. Spacer
4. Anti-Scalp Rollers
5. Nut

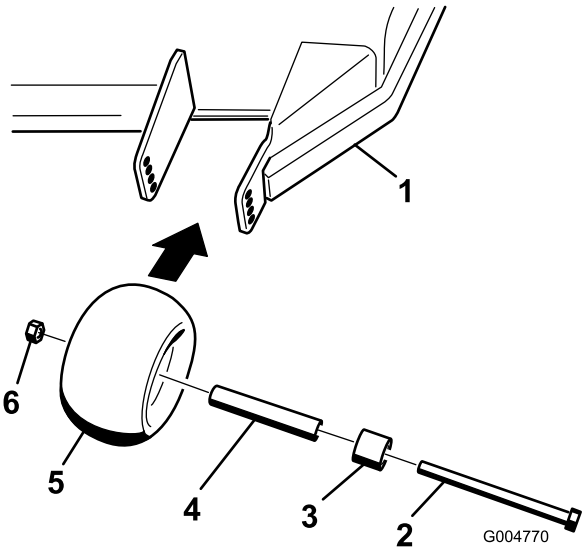



**Figure 15**

1. Mower deck
2. Bolt
3. Spacer
4. Bushing
5. Anti-Scalp Rollers
6. Nut

5. 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 3/8 inch (10 mm) 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 pins and clevis pins from the drive levers and neutral locks (Figure 16).


**Figure 16**

1. Control rod
2. Clevis pin
3. Drive lever
4. Operator Presence Control lever (OPC)
5. Left handle shown
6. Neutral lock
7. Hairpin cotter pin

2. Loosen the nuts holding the swivel connected to the speed control crank (Figure 17).
3. Remove the front bolt from speed control crank (Figure 17).
4. Loosen the back bolt holding the speed control rod to the speed control crank (Figure 17).

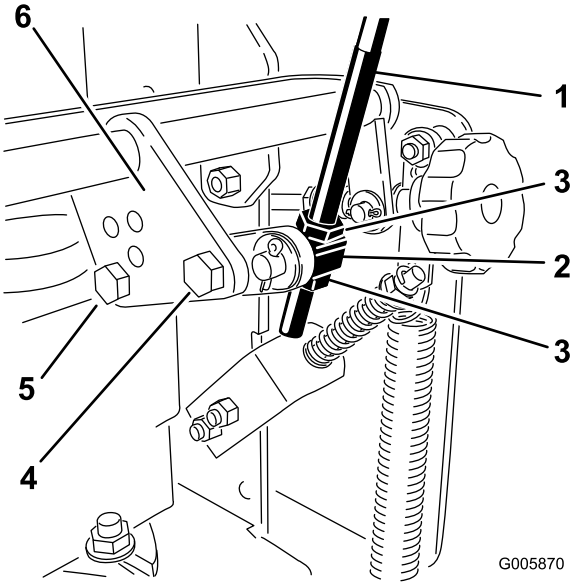



**Figure 17**

1. Speed control rod
2. Swivel
3. Nut
4. Front bolt
5. Back bolt
6. Speed control crank

5. Loosen the upper flange bolts (3/8 x 1-1/4 inches) and flange nut securing the handle to the rear frame (Figure 18).
6. Remove the lower flange bolts (3/8 x 1 inch) and flange nuts securing the handle to the rear frame (Figure 18).
7. Pivot handle to desired operating position and install lower flange bolts (3/8 x 1 inch)and flange nuts into mounting holes. Tighten all flange bolts.

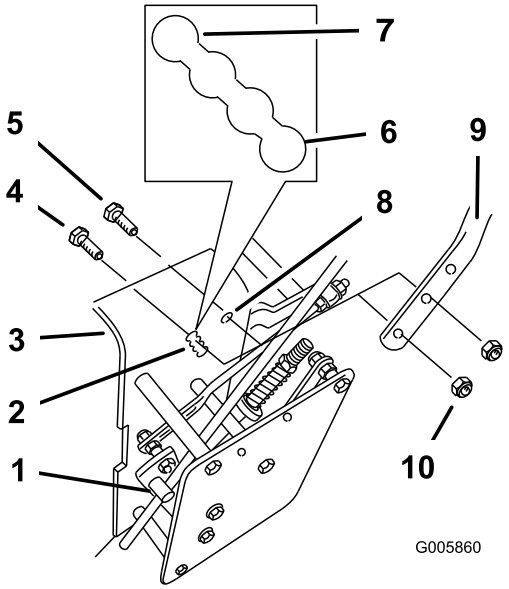



**Figure 18**

1. Control rod fitting
2. Lower mounting holes
3. Rear frame
4. Lower flange bolt (3/8 x 1 inch)
5. Upper flange bolt (3/8 x 1-1/4 inches)
6. High position
7. Lower position
8. Upper mounting hole
9. Handle
10. Flange nut (3/8 inch)

8. Note what hole the handle was installed (Figure 19).
9. Install the front bolt into the corresponding hole that was used for the handle height (i.e. with the handle set to hole number 3, the front bolt in the speed control crank needs to be set to hole number 3) (Figure 19).
10. Tighten the back bolt holding the speed control rod to the speed control crank (Figure 19).

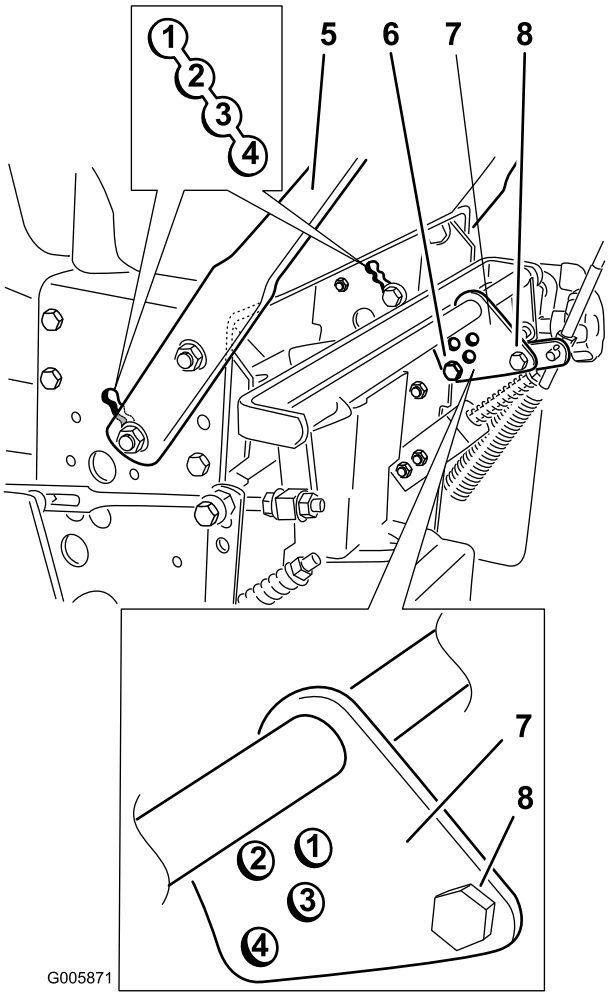



**Figure 19**

1. Match the hole in speed control crank with handle height
2. Match the hole in speed control crank with handle height
3. Match the hole in speed control crank with handle height
4. Match the hole in speed control crank with handle height
5. Handle
6. Front bolt
7. Speed control crank
8. Back bolt

11. Adjust the swivel on the speed control rod and tighten the nuts against the swivel (Figure 17).
12. Adjust the control rod length by rotating the control rod in the rod fitting (Figure 17).
13. Install the hairpin cotter between drive levers and neutral locks and into clevis pins (Figure 16).

**Note:** Make sure the clevis pins are inserted into the neutral locks.

14. Perform the hydraulic linkage adjustments when the handle height is changed; refer Hydraulic Linkage Adjustments.

## 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 cam lock, swing the lever up to loosen the cam lock (Figure 20).
4. Adjust the baffle and cam lock in the slot to the desired discharge flow.
5. Swing the lever back over to tighten the baffle and cam lock (Figure 20).
6. If the cam does not lock the baffle into place or it is too tight, loosen the lever and then rotate the cam lock. Adjust the cam lock until the desired locking pressure is achieved.

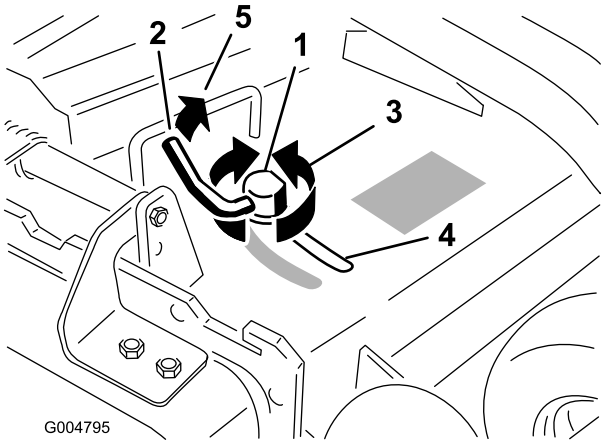



**Figure 20**

1. Cam lock
2. Lever
3. Rotate cam to increase or decrease locking pressure
4. Slot

## 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 a follows.

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

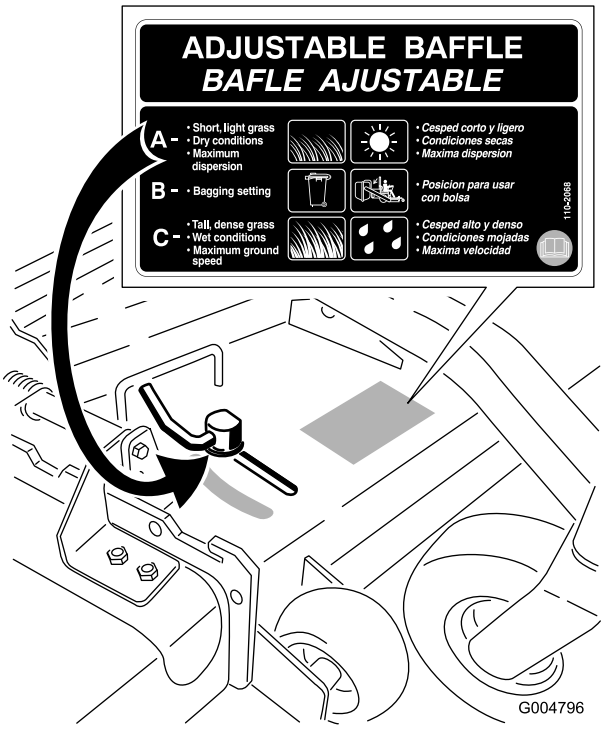



**Figure 21**

## Position B

Use this position when bagging (Figure 22).

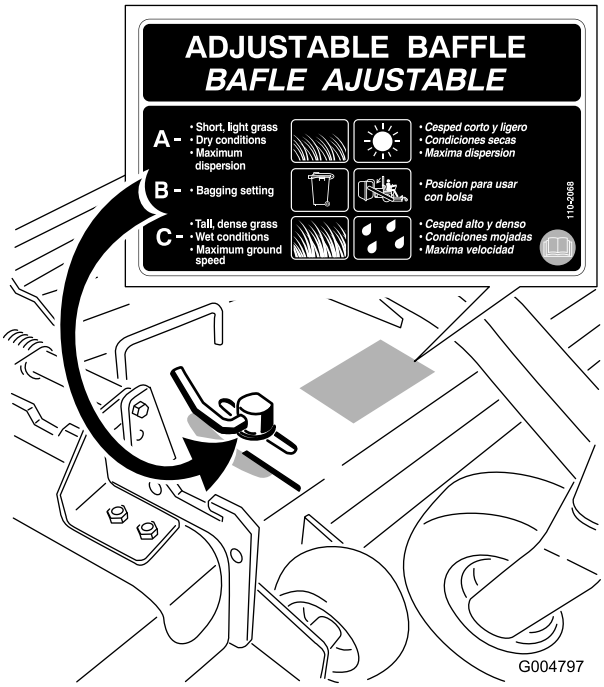



**Figure 22**

## 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.
- This position is similar to the benefits of the Toro SFS mower.

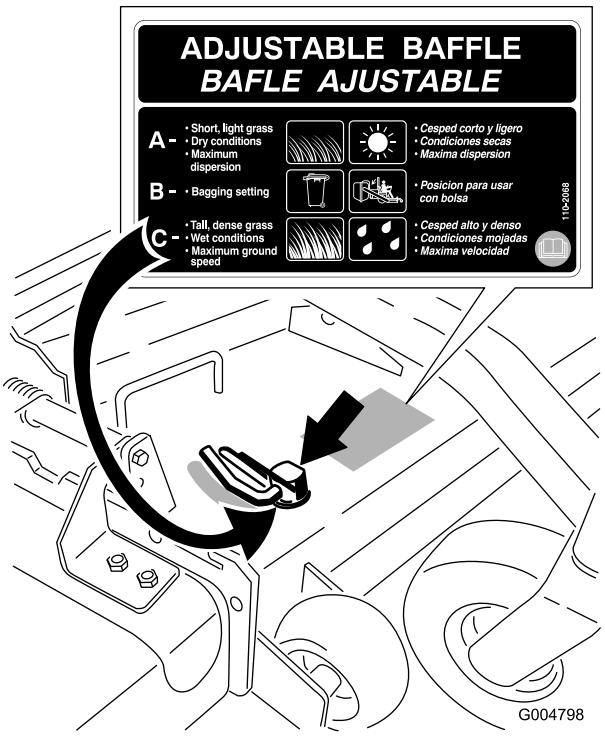



**Figure 23**

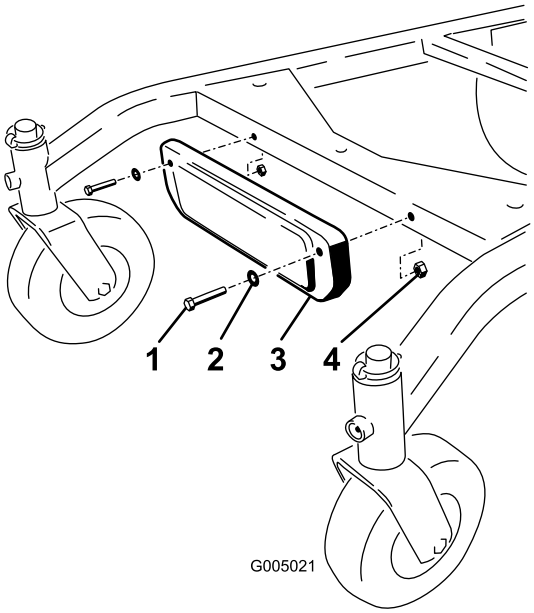



**Figure 24**

Installing optional front weight.

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

## Using the Mid-Size Weight

Weights are available for 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).

Contact an Authorized Service Dealer for the correct Weight Kit and installation.

- 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.

**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 form the carrier frame.**

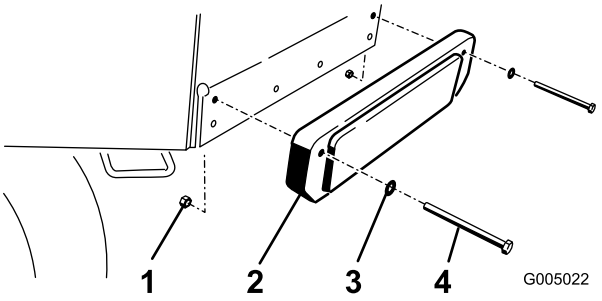



**Figure 25**

Installing optional rear weight.

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

# Maintenance

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

## *Recommended Maintenance Schedule(s)*

| Maintenance Service Interval | Maintenance Procedure |
|---|---|
| After the first 8 operating hours | • Change the engine oil.<br>• Check the hydraulic fluid level.<br>• Change the hydraulic filter. |
| Before each use or daily | • Check the safety system.<br>• Grease the front caster pivot bearing.<br>• Check the engine oil level.<br>• Clean the air intake screen.<br>• Check the brakes.<br>• Inspect the blades.<br>• Clean the mower deck. |
| Every 25 hours | • Check the battery electrolyte level.<br>• Check the hydraulic fluid level. |
| Every 50 hours | • Grease the side bearings.<br>• Grease the PTO belt idler.<br>• Grease the mower deck belt idler.<br>• Check the tire pressure.<br>• Check the mower belt.<br>• Check the PTO drive belt.<br>• Check the pump drive belt. |
| Every 100 hours | • Change the engine oil.<br>• Check the spark plugs.<br>• Adjust the electric clutch.<br>• Check the hydraulic lines. |
| Every 200 hours | • Replace the air filter (more often in dirty or dusty conditions).<br>• Change the oil filter.<br>• Replace the fuel filter.<br>• Change the hydraulic filter. |
| Every 400 hours | • Grease the front wheel bearings (more often in dirty or dusty conditions). |
| Before storage | • Paint chipped surfaces.<br>• Perform all maintenance procedures listed above before storage. |
| Yearly | • Lubricate the caster wheel hubs. |

**Important: Refer to your Engine Operator's Manual for additional maintenance procedures.**

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

**Remove the key from the ignition 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.

## How to Grease

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

Grease the bearings on both sides of the machine (Figure 26).

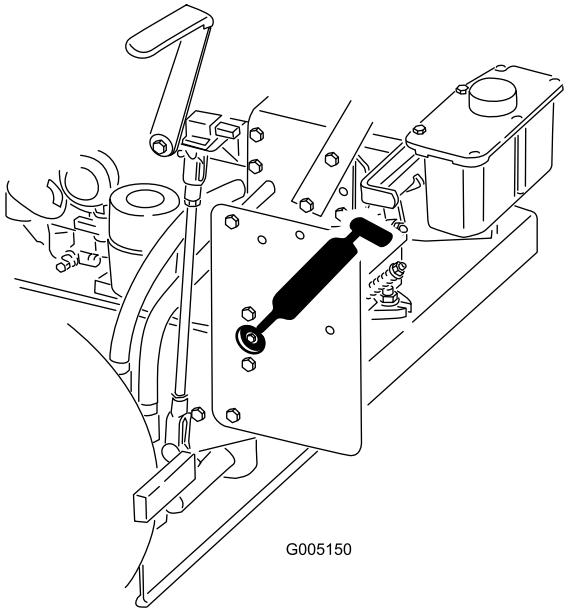



**Figure 26**

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

Grease the idler pulley pivots (Figure 27).

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

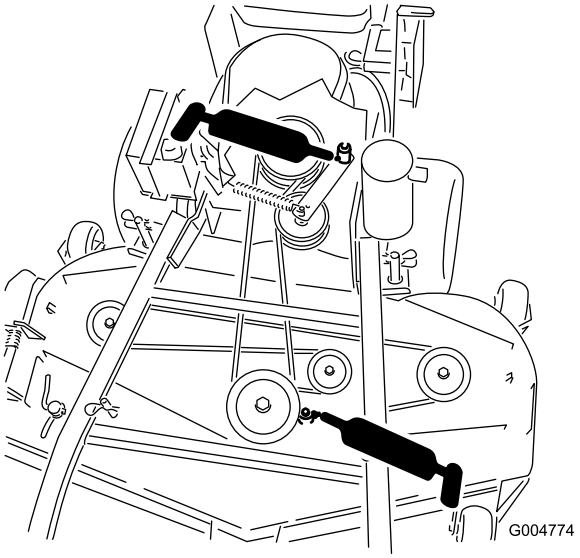



**Figure 27**

## Lubricating the Caster Wheel Hubs

**Note:** When performing this procedure, the old seals will need to be replaced with new seals. Contact an Authorized Service Dealer for the correct seals.

1. Disengage the PTO, move the motion control levers to the neutral locked position and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Raise the front of the machine and support it with jack stands.
4. Remove then nut and bolt holding the caster wheel to the front caster fork (Figure 28).
5. Remove the seal guard from the wheel hub (Figure 28).

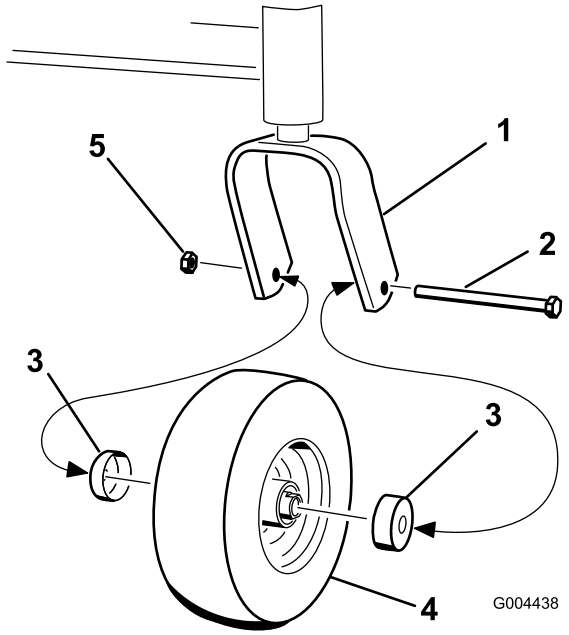



**Figure 28**

1. Caster fork
2. Bolt
3. Seal guard
4. Caster wheel
5. Nut

6. Remove **one** of the spacer nuts (with wrench flats) from the axle (Figure 30).

   **Note:** Thread locking adhesive has been applied to the spacer nuts.

7. Remove the axle **without** removing the opposite spacer nut (Figure 30).
8. Remove the seals and inspect the bearings for wear or damage. Replace the bearings if needed.
9. Pack the bearings with general purpose grease.
10. Insert the bearing and a new seal into the wheel (Figure 30).

    **Note:** Do not install the nut all the way onto the axle.

11. If both spacer nuts were removed from the axle, apply thread locking adhesive to the spacer nut. Install the spacer nuts onto the axle leaving an 1/8 inch (3mm) of the nut past the axle (Figure 29).

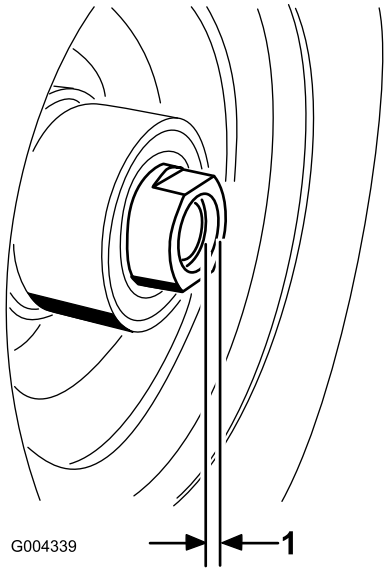



**Figure 29**

1. 1/8 inch (3 mm) of the nut past the axle

12. Install the assembled nut and axle into the wheel on the side with the bearing and a new seal (Figure 30).
13. Place the wheel with the open end facing up and fill the area inside the wheel with multi-purpose grease.
14. Install the second bearing and a new seal into the wheel (Figure 30).
15. Apply thread locking adhesive to the second spacer nut and install it onto the axle with the wrench flats facing outward.
16. Torque the spacer nut to 75-80 in-lb (8-9 N·m) then loosen it and torque it to 20–25 in-lb (2-3 N·m). Make sure the axle does not extend past either nut (Figure 29).
17. Install the seal guards over the wheel hubs and insert the wheel into the caster fork (Figure 28).
18. Install the caster bolt and tighten the nut (Figure 28).

    **Important: Check the bearing adjustment often to prevent seal and bearing damage. Spin the caster tire. The tire should not spin freely more than 1 to 2 revolutions or have any side-to-side play between the caster fork. If the wheel spins freely, adjust the torque on the spacer nut until there is a slight amount of drag.**

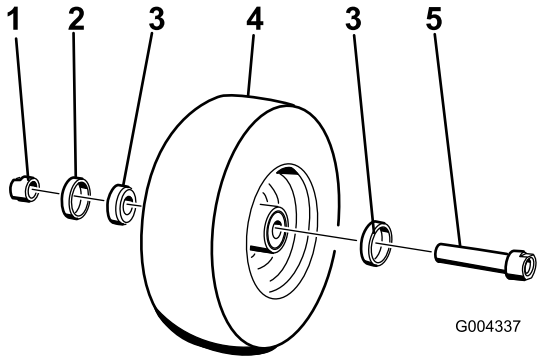



**Figure 30**

1. Spacer nut
2. Bearing seal (new seals required)
3. Bearing
4. Caster wheel
5. Nut and axle assembled

# *Engine Maintenance*

## Servicing the Air Cleaner

Replace the air filter every 200 operating hours.

**Note:** Service the filter more frequently if operating conditions are extremely dusty or sandy.

### Removing the Filters

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. Release the latches on the air cleaner and pull the air cleaner cover off of the air cleaner body (Figure 31).

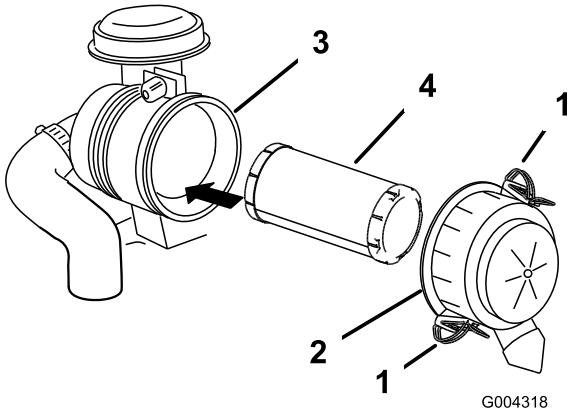



**Figure 31**

1. Latches
2. Air cleaner cover
3. Air filter body
4. Primary filter

4. Clean the inside of the air cleaner cover with compressed air.
5. Gently slide the air filter out of the air cleaner body (Figure 31). Avoid knocking the filter into the side of the body.
6. Inspect the air filter for damage by looking into the filter while shining a bright light on the outside of the filter. Holes in the filter will appear as bright spots. If the filter is damaged discard it.

### Servicing the Air Filter

Do not clean the filter. Replace it after 200 operating hours.

### Installing the Air Filter

**Important: To prevent engine damage, always operate the engine with the air filter and cover installed.**

1. If installing a new filter, check it for shipping damage. Do not use a damaged filter.
2. Carefully slide the air filter into the body (Figure 31).

   **Note:** Ensure that it is fully seated by pushing on the outer rim of the filter while installing it.

   **Important: Do not press on the soft inside area of the filter.**
3. Install the air cleaner cover with the side indicated as **UP** facing up and secure the latches (Figure 31).

## Servicing the Engine Oil

### Service Interval/Specification

Check the engine oil level daily.

Change the engine oil as follows:

- After the first 8 operating hours
- After every 100 operating hours

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

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

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 32).

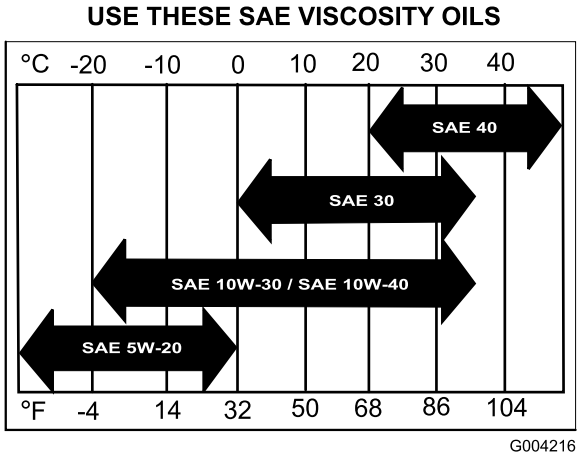



**Figure 32**

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

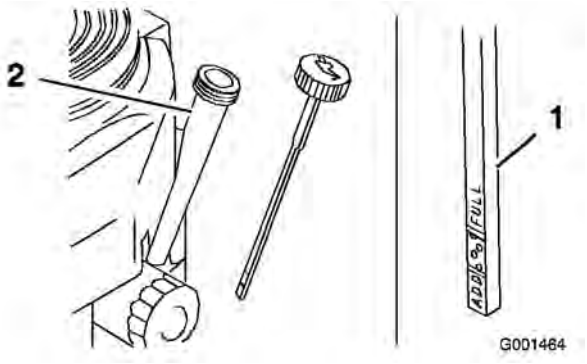



**Figure 33**

1. Oil dipstick 2. Filler tube

5. Unscrew the oil dipstick and wipe the end clean (Figure 33).
6. Slide the oil dipstick fully into the filler tube, but do not thread onto tube (Figure 33).
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 Oil

1. Start the engine and let it run five minutes. This warms the oil so it drains better.
2. Park the machine so that the drain side is slightly lower than the opposite side to assure the oil drains completely.
3. Disengage the PTO and set the parking brake.
4. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
5. Slide the drain hose over the oil drain valve.
6. Place a pan below the drain hose. Rotate oil drain valve to allow oil to drain (Figure 34).
7. When oil has drained completely, close the drain valve.
8. Remove the drain hose (Figure 34).

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

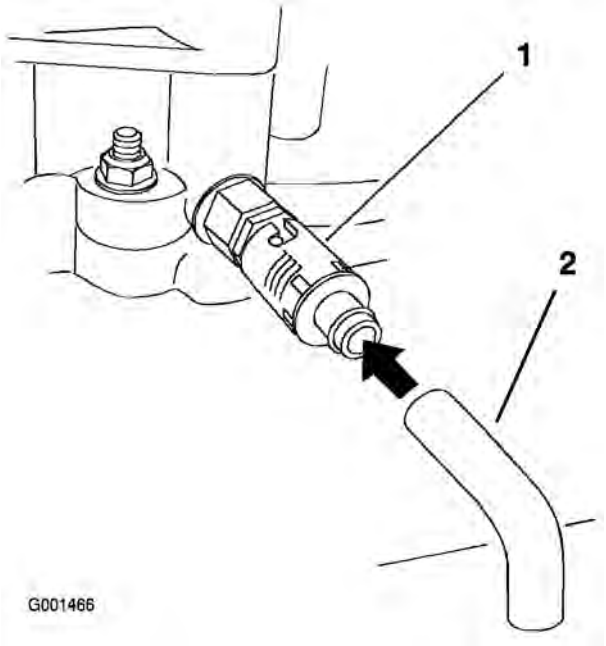



**Figure 34**

1. Oil drain valve 2. Oil drain hose

9. Slowly pour approximately 80% of the specified oil into the filler tube (Figure 33).

10. Check the oil level; refer to Checking the Engine Oil Level.
11. Slowly add the additional oil to bring it to the **Full** mark.

### Changing the Oil Filter

Replace the oil filter every 200 operating hours or every other oil change.

**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 35).

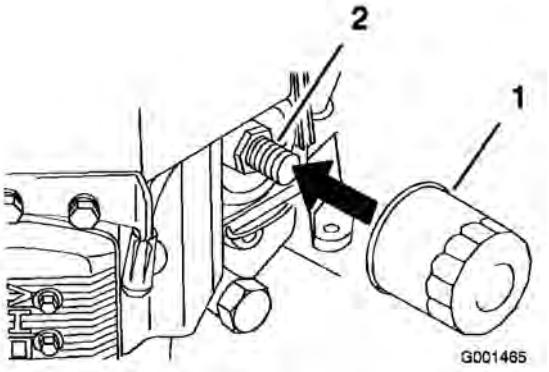



**Figure 35**

1. Oil filter
2. Adapter

3. Apply a thin coat of new oil to the rubber gasket on the replacement filter (Figure 35).
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 35).
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

Check the spark plugs after every 100 operating hours.

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

Type: NGK BPR4ES or equivalent Air Gap: 0.030 inch (0.75 mm)

### 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 36).

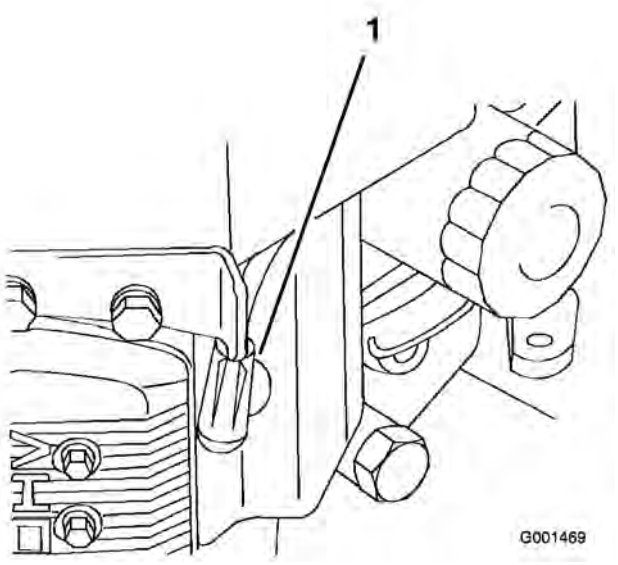



**Figure 36**

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 37). 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.

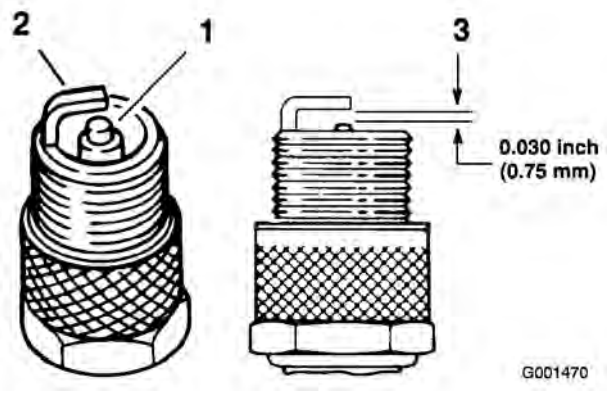



**Figure 37**

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 37). Bend the side electrode (Figure 37) 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 16 ft-lb (22 N·m).
3. Connect the wires to the spark plugs (Figure 37).

# *Fuel System Maintenance*

## Draining the Fuel Tank

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

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

1. Park the machine on a level surface, to assure fuel tank drains completely. 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 38).
3. Squeeze the ends of the hose clamp together and slide it up the fuel line away from fuel filter (Figure 38).
4. Pull the fuel line off the fuel filter (Figure 38). 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.
6. Wipe up any spilled fuel.

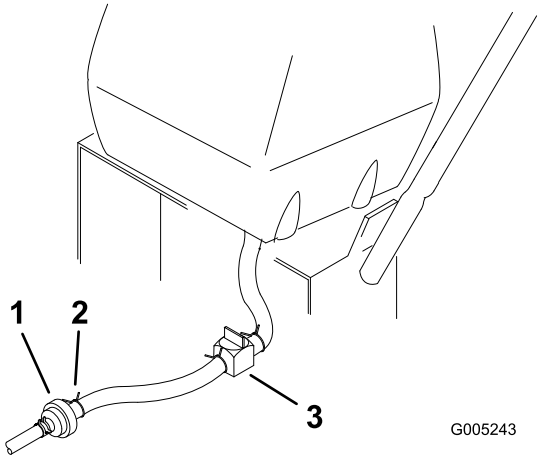



**Figure 38**

1. Fuel shut-off valve
2. Clamp

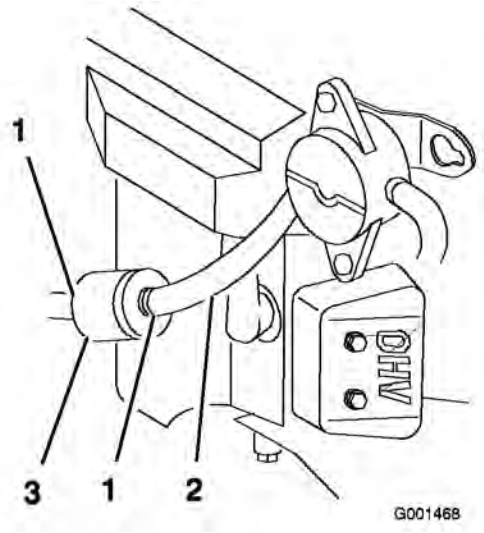



**Figure 39**

1. Hose clamp
2. Fuel line
3. Filter

## Servicing the Fuel Filter

Replace the fuel filter after every 200 operating hours or yearly, whichever occurs first.

### Replacing the Fuel Filter

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

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

**Note:** Wipe up any spilled fuel.

1. Disengage the PTO and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Close fuel shut-off valve at the fuel tank (Figure 38).
4. Squeeze the ends of the hose clamps together and slide them away from the filter (Figure 39).
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 38).
8. Check for fuel leaks and repair if needed.
9. Wipe up any spilled fuel.

# *Electrical System Maintenance*

## Servicing the Battery

Check the electrolyte level in the battery every 25 hours. Always keep the battery clean and fully charged. Use a paper towel to clean the battery case. If the battery terminals are corroded, clean them with a solution of four parts water and one part baking soda. Apply a light coating of grease to the battery terminals to prevent corrosion.

Voltage: 12 V

## Warning

**CALIFORNIA**
**Proposition 65 Warning**

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

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

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

### Removing the Battery

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

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

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

- **Always Disconnect the negative (black) battery cable before disconnecting the positive (red) cable.**
- **Always Reconnect the positive (red) battery cable before reconnecting the negative (black) cable.**

1. Disengage the PTO and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Lift the black rubber cover on the negative cable. Disconnect the negative battery cable from the negative (-) battery terminal (Figure 40).
4. Slide the red terminal boot off the positive (red) battery terminal. Then remove the positive (red) battery cable (Figure 40).
5. Remove the battery hold down plate (Figure 40) and remove the battery.

### Installing the Battery

1. Place the batter onto the machine (Figure 40).
2. Secure the battery with the hold down plate, j-bolts, and locknuts.
3. First, install the positive (red) battery cable to positive (+) battery terminal with a nut, washer and bolt (Figure 40). Slide the rubber cover over the post.
4. Then install the negative battery cable and ground wire to the negative (-) battery terminal with a nut, washer and bolt (Figure 40). Slide the rubber cover over the post.

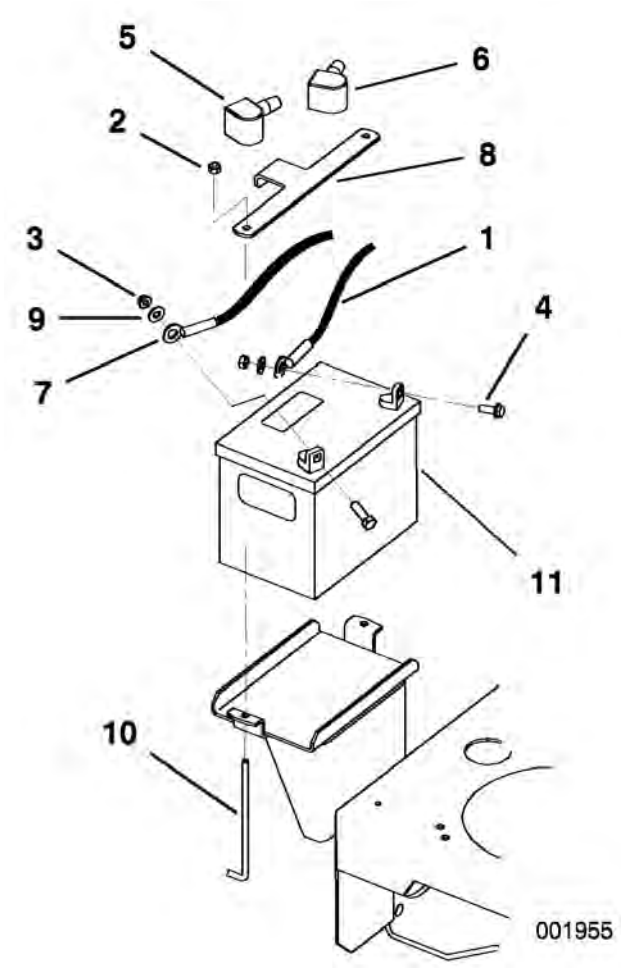



**Figure 40**

1. Negative cable
2. Nut (1/4 in.)
3. Nut (5/16 in.)
4. Bolt
5. Rubber cover (red)
6. Rubber cover (black)
7. Positive cable
8. Battery hold down plate
9. Washer
10. Battery hold down
11. Battery

## Checking the Battery Electrolyte Level

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

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

1. Look at the side of the battery. The electrolyte must be up to the **upper** line (Figure 41). Do not allow the electrolyte to fall below the Lower line (Figure 41).

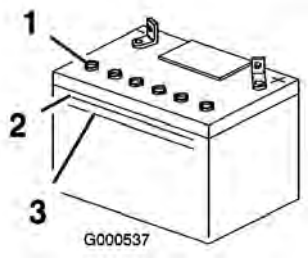



**Figure 41**

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

2. If the electrolyte is low, add the required amount of distilled water; refer to Adding Water to the Battery in Electrical System Maintenance, page 33.

## Adding Water to the Battery

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

1. Remove the battery from the machine; refer to Removing the Battery in Electrical System Maintenance, page 33.

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

2. Clean the top of the battery with a paper towel.
3. Remove the vent caps from the battery (Figure 41).
4. Slowly pour distilled water into each battery cell until the electrolyte level is up to the Upper line (Figure 41) on the battery case.

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

5. Wait five to ten minutes after filling the battery cells. Add distilled water, if necessary, until the electrolyte level is up to the Upper line (Figure 41) on the battery case.
6. Reinstall the battery vent caps.

### Charging the Battery

**Charging the battery produces gasses that can explode.**

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

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

1. Remove the battery from the chassis; refer to Removing the Battery.
2. Check the electrolyte level; refer to Checking the Electrolyte Level.
3. Make sure the filler caps are installed in battery. Charge battery for 1 hour at 25 to 30 amps or 6 hours at 4 to 6 amps.
4. When the battery is fully charged, unplug the charger from the electrical outlet, then disconnect the charger leads from the battery posts (Figure 42).
5. Install the battery onto the machine and connect the battery cables, refer to Installing the Battery.

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

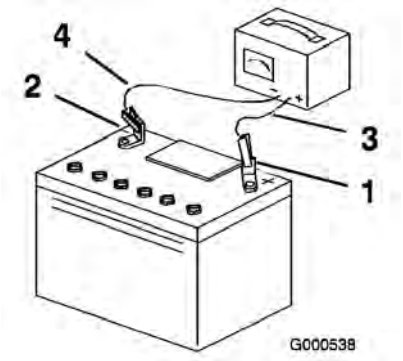



**Figure 42**

1. Positive Battery Post
2. Negative Battery Post
3. Red (+) Charger Lead
4. Black (-) Charger Lead

## Servicing the Fuses

The electrical system is protected by fuses. It requires no maintenance. If a fuse blows, check the component or circuit for a malfunction or short. Pull out on the fuse to remove or replace it (Figure 43).

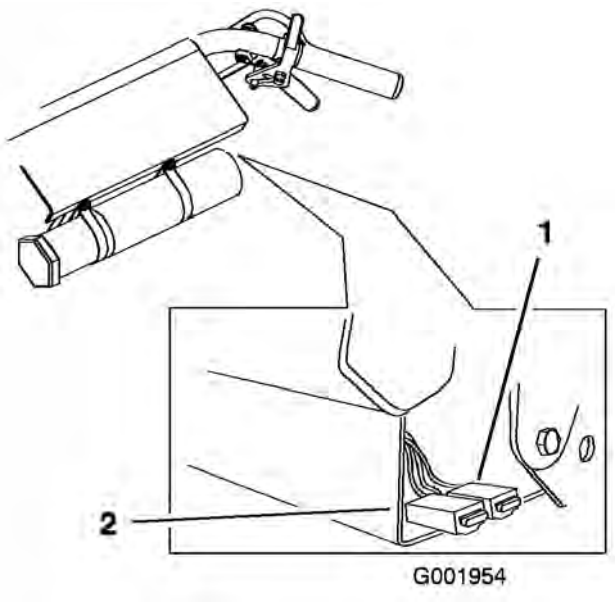



**Figure 43**

1. Fuse, 25 amp, blade type
2. Fuse, 30 amp, blade type

# *Drive System Maintenance*

Perform the following linkage adjustments when the machine needs maintenance. Perform steps Adjust the Speed Control Linkage through Adjusting the Tracking. If and adjustment is needed , do them in the order that they are listed.

## Adjusting the Speed Control Linkage

1. Disengage the PTO and set the parking brake.
2. Stop the engine and wait for all moving parts to stop before leaving the operating position.
3. Check the adjustment of the speed control crank arm. It must match the handle bar height setting. Refer to Adjusting the Handle Bar Height.
4. Move the speed control lever (located on the console) to the full forward position (Figure 44).

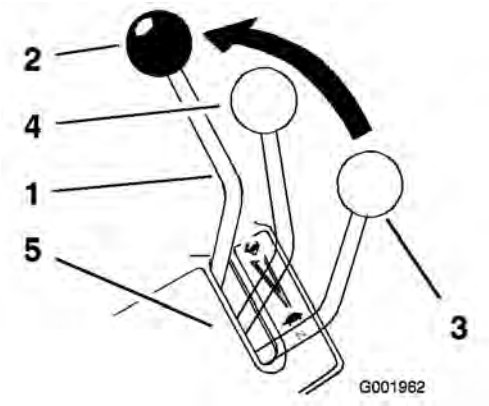



**Figure 44**

1. Speed control lever
2. Full speed position
3. Neutral position
4. Medium speed position
5. Control panel

5. Check the orientation of the tabs on the ends of the speed control crank. These tabs should be pointing straight down at the 6 o'clock position approximately (Figure 45).
6. If adjustment is needed, loosen the nuts on both sides of the swivel on the speed control rod (Figure 45).
7. Adjust the swivel until the tabs are at the 6 o'clock position (Figure 45).
8. Tighten the nuts on both sides of the swivel (Figure 45).

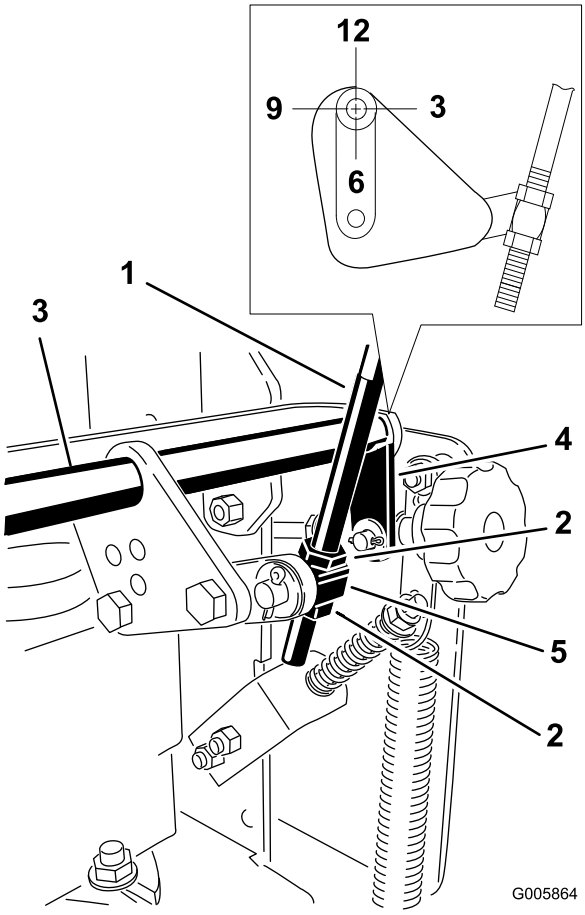



**Figure 45**

1. Speed control rod
2. Jam nut
3. Speed control crank
4. Tabs, 6 o'clock position
5. Swivel

9. Pull the speed control lever back to neutral.
10. Check the travel of the shift lever in the control panel slot. The shift lever travel should be approximately centered in the control panel slot (Figure 44).
11. If needed, adjust the swivel on the speed control rod to center the shift lever travel (Figure 45).
12. With the speed control lever in the neutral position, check to make sure the safety switch is depressed and there is an 1/8 to 1/4 inch (3 to 6 mm) space between the actuating tab and the safety switch (Figure 46)..

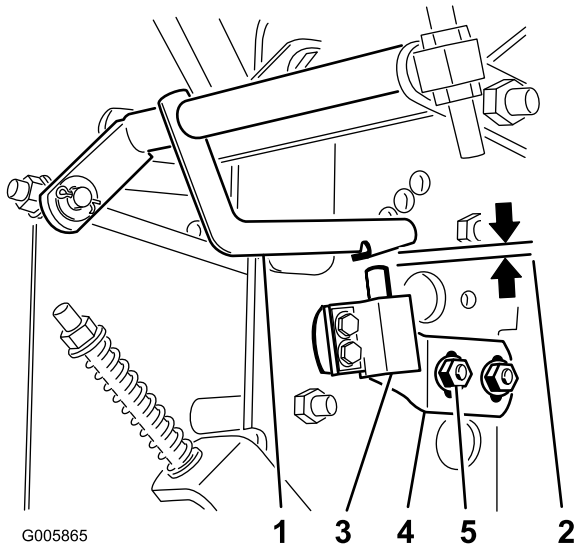



**Figure 46**

1. Actuating tab
2. 1/8 to 1/4 inch (3 to 6 mm) space
3. Safety switch
4. Neutral bracket
5. Neutral bracket bolts

13. To adjust the switch location, loosen the two neutral bracket bolts holding the switch plate to the frame (Figure 46).
14. Adjust the switch up or down to obtain an 1/8 to 1/4 inch (3 to 6 mm) space (Figure 46).
15. Tighten the two neutral bracket screws holding the switch plate (Figure 46).

## Temporary Neutral Stud Adjustment

**Note:** Perform the following procedures on both the left and right sides.

1. Move the left and right hand neutral lock latches to the unlatched position.
2. Move the speed control lever to the neutral position (Figure 44).
3. Loosen the nut against the yoke Figure 47).
4. Adjust the length of the neutral stud and yoke assembly so the clevis pin does not contact the back of the slot in the control arm bracket Figure 47).
5. Tighten the nut against the yoke Figure 47).

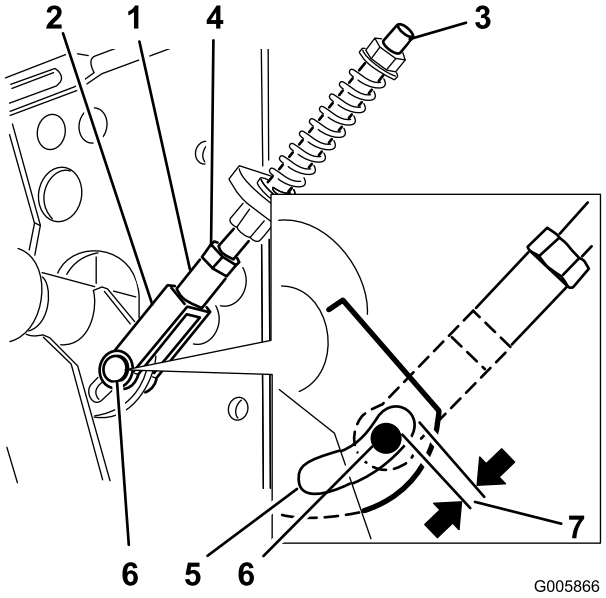



**Figure 47**

1. Neutral control linkage
2. Yoke
3. Neutral stud
4. Nut against yoke
5. Slot in control arm bracket
6. Clevis pin
7. Clevis pin does not contact the back of slot

## Adjusting the Hydro Control Linkages

**Engine must be running so control linkage adjustments can be performed. Contact with moving parts or hot surfaces may cause personal injury.**

**Keep hands, feet, face, clothing and other body parts away from rotating parts, muffler and other hot surfaces.**

**Mechanical or hydraulic jacks may fail to support machine and cause a serious injury.**

- **Use jack stands when supporting machine.**
- **Do not use hydraulic jacks.**

### Adjusting the Left Side Linkage

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

3. Raise the rear of the machine onto jack stands high enough to raise the drive wheels off of the ground.
4. Disengage the parking brake.
5. Start the engine and move the throttle ahead to the full throttle position.
6. Press and hold the OPC levers down.

   **Note:** The OPC levers must be held down whenever the speed control lever is out of the neutral position or the engine will kill.
7. Place the left drive lever in the full forward position.
8. Place the speed control lever in the neutral position.

**Electrical system will not perform proper safety shut off with Operator Presence Control (OPC) levers fastened in place.**

- **Make sure Operator Presence Control (OPC) levers are working when adjustment is completed.**
- **Never operate this unit with Operator Presence Control (OPC) levers fastened in place.**

9. Loosen the front adjusting nut on left hydro control linkage as shown in Figure 48.
10. Turn the left rear adjusting nut counter-clockwise until wheel rotates forward (Figure 48).
11. Turn the rear adjusting nut clockwise 1/4 of a turn at a time. Then move the speed control lever forward and back to neutral. Repeat this until left wheel stops rotating forward (Figure 48).

    **Note:** Make sure flat part of the linkage is perpendicular to the pin of the swivel (Figure 48).
12. After adjusting the left hydro control linkage, move the speed control lever forward and then back to the neutral position.
13. Make sure the speed control lever is in the neutral position and the tire does not rotate.
14. Repeat the adjustment if needed.

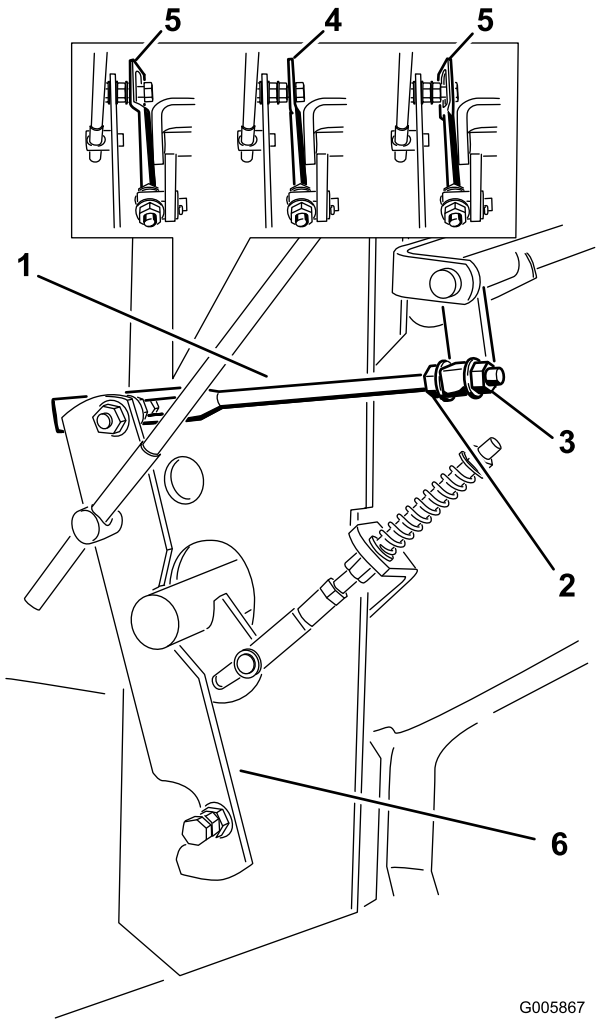



**Figure 48**

1. Hydro control linkage
2. Front adjusting nut
3. Rear adjusting nut
4. Correct position
5. Incorrect position
6. Control arm

**Note:** If inconsistent neutral occurs, check to be sure both springs are properly tightened on the speed control lever under the console, especially the rear pivot spring. Repeat above adjustments if necessary (Figure 49).

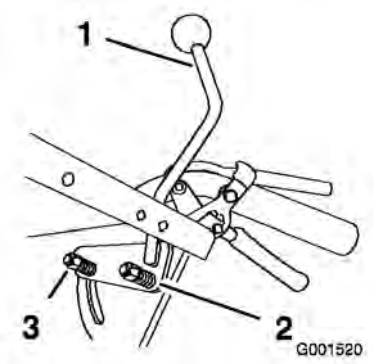



**Figure 49**

1. Speed control lever
2. Rear pivot spring
3. spring

15. Tighten the front nut on left hydro control linkage shown in Figure 48.

## Adjusting the Right Side Linkage

1. With the machine on jack stands, place the speed control lever in the neutral position.
2. Place the right drive lever in the full forward position.
3. Hold the OPC levers down.

   **Note:** The OPC levers must be held down whenever the speed control lever is out of the neutral position or the engine will kill.
4. Adjust the right side linkage by turning the quick track knob counterclockwise until the tire begins to rotate forward (Figure 50).
5. Turn the knob clockwise a 1/4 of a turn at a time. Then move the speed control forward and back to neutral. Repeat this until right wheel stops rotating forward (Figure 50).
6. The spring that keeps tension on the knob should normally not need adjustment. However if an adjustment is needed, adjust the length of spring to 1 inch (26 mm) between the washers (Figure 50).
7. Adjust the spring length by turning the nut at the front of spring (Figure 50).
8. After adjusting the right hydro control linkage, move the speed control lever forward and then back to the neutral position.
9. Make sure the speed control lever is in the neutral position and the tire does not rotate.
10. Repeat adjustment if needed.

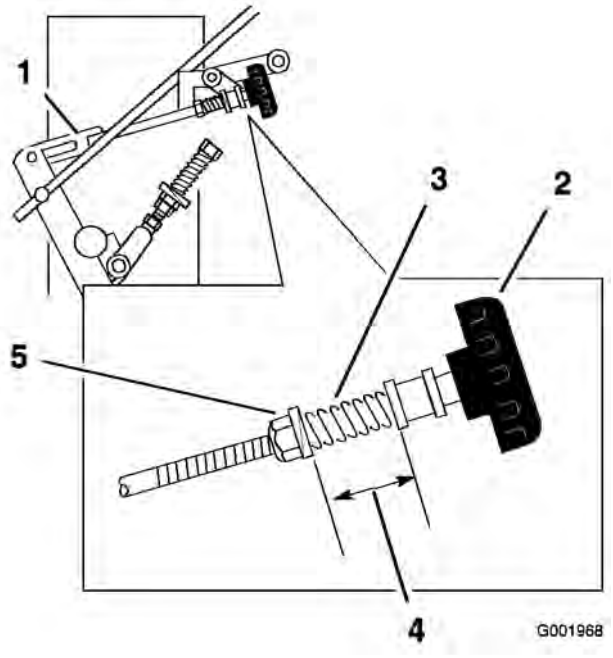



**Figure 50**

1. Hydro control linkage
2. Quick track knob
3. Spring
4. 1 inch (26 mm)
5. Nut in front of spring

## Checking and Adjusting the Left and Right Speed Control Linkage Travel

The speed control lever has extra travel available to ensure full pump engagement.

It is important to have the same amount of travel for both the left and right speed control linkages.

1. Move the speed control lever to the full speed forward position.
2. Measure the gap as shown in Figure 51 for both the left and right sides. No adjustment is needed if they are equal.
3. If needed, adjust the right side linkage by turning the quick track knob until the gap in Figure 51 matches the left side (Figure 50).
4. If needed, adjust the left side linkage by adjusting the front and back swivel nuts until the gap in Figure 51 matches the right side (Figure 48).
5. After adjusting the hydro control linkage, move the speed control lever forward and then back to the neutral position.

6. Make sure the speed control lever is in the neutral position and the tires do not rotate.
7. Repeat the linkage adjustments if needed to obtain neutral position.

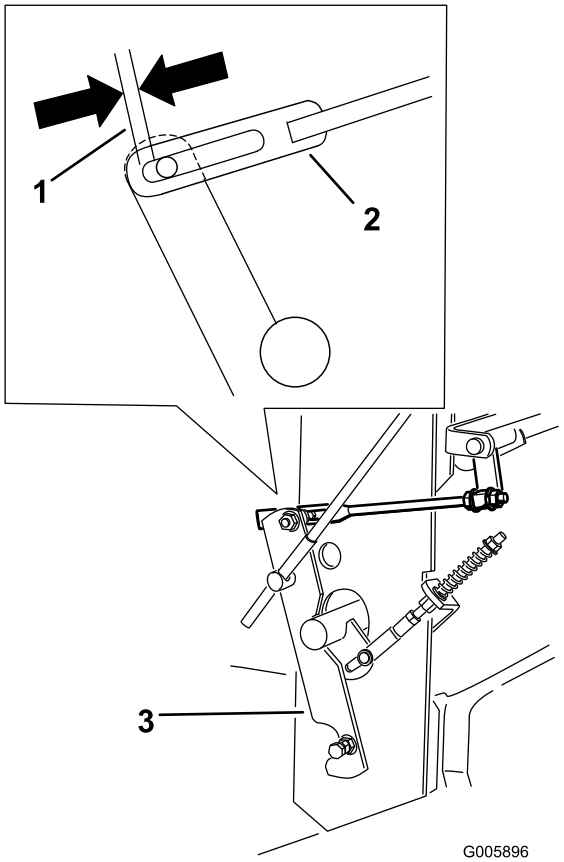



**Figure 51**

1. Gap needs to be equal on left and right side
2. Hydro control linkage
3. Control arm

## Adjusting the Neutral Stud

**Electrical system will not perform proper safety shut off with Operator Presence Control (OPC) levers held in place.**

- **Make sure Operator Presence Control (OPC) levers are working when adjustment is completed.**
- **Never operate this unit with Operator Presence Control (OPC) levers held in place.**

**Mechanical or hydraulic jacks may fail to support machine and cause a serious injury.**

- **Use jack stands when supporting machine.**
- **Do not use hydraulic jacks.**

1. With the machine on jack stands, place the speed control lever in the neutral position.
2. Hold the OPC levers down.

   **Note:** The OPC levers must be held down whenever the speed control lever is out of the neutral position or the engine will kill.
3. Adjust the left and right neutral stud until the clevis pin in the yoke touches the back end of the slot in the control arm (Figure 52).
4. Move the speed control lever to the full forward position.
5. Squeeze one drive lever until an increased resistance is felt. This is neutral position. This is where the clevis pin in the yoke comes to the back end of the slot in the control arm bracket.

   **Note:** Make sure you have not reached the end of the neutral lock slot. If you have, shorten the control lever linkage. Refer to Adjusting the Control Rod.
6. If the wheel turns while holding the drive lever in neutral, the neutral stud needs to be adjusted (Figure 52). If wheel stops then go to .
7. Loosen the nut against the yoke (Figure 52).
8. Adjust the adjustment stud until the respective drive wheel stops while holding the drive in the neutral position (increased resistance) (Figure 52).
9. Turn the adjusting bolt approximately 1/4 turn clockwise if the wheel is turning in reverse or turn the bolt approximately 1/4 turn counter-clockwise if the wheel is turning forward (Figure 52).
10. Release the drive lever to the forward drive position and squeeze back into the neutral position. Check to see if the wheel stops. If not, repeat the above adjustment procedure.
11. After adjustments are made, tighten the nuts against the yokes.
12. Repeat this procedure for the opposite side.

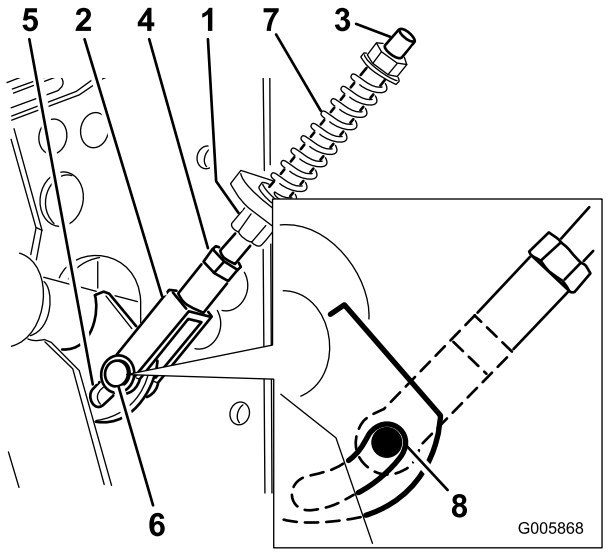



**Figure 52**

1. Neutral control linkage
2. Yoke
3. Neutral stud
4. Nut
5. Slot in control arm bracket
6. Clevis pin
7. Spring
8. Back end of slot

# Adjusting the Control Rod

## Checking the Control Rod

1. With rear of machine still on jack stands and engine running at full throttle, move the speed control lever to the medium speed position.

   **Note:** The OPC levers must be held down whenever the speed control lever is out of the neutral position or the engine will kill.
2. Move the respective drive lever upward until it reaches the neutral position and engage neutral locks.
3. If the tire rotates in either direction, the length of the control rod will need to be adjusted.

## Adjusting the Control Rod

1. Adjust the rod length by releasing the drive lever and removing the hairpin cotter pin and clevis pin. Rotate the rod in the rod fitting (Figure 53).
2. Lengthen the control rod if the tire is turning in reverse and shorten the rod if the tire is turning forward.
3. Rotate the rod several turns if the tire is rotating fast. Then, adjust the rod in 1/2 turn increments.
4. Place the clevis pin into the drive lever (Figure 53).


**Figure 53**

1. Control rod
2. Clevis pin
3. Drive lever
4. Operator Presence Control lever (OPC)
5. Left handle shown
6. Neutral lock
7. Hairpin cotter pin

5. Release and engage neutral lock checking that the tire does not rotate (Figure 54). Continue this process until the tire does not rotate.
6. Install the hairpin cotter pin between the drive levers and the neutral locks and into the clevis pins (Figure 53).

   **Note:** Make sure the clevis pins are inserted into the neutral locks.
7. Repeat this adjustment for the opposite side.

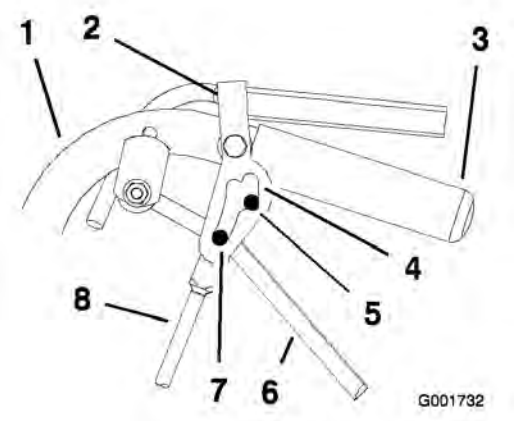



**Figure 54**

1. Handle
2. Neutral lock
3. Handle
4. Neutral lock slot
5. Neutral position
6. Drive lever
7. Full speed forward
8. Control rod

# Adjusting the Tracking

1. Remove machine from any jack stands.

2. Check the rear tire pressure. Refer to Checking the Tire Pressure.
3. Start and run the machine. Observe the tracking on a level, smooth, hard surface such as concrete or asphalt.
4. If the unit tracks to one side or the other, turn the quick track knob. Turn the knob right to steer right and turn the knob left to steer left (Figure 55).

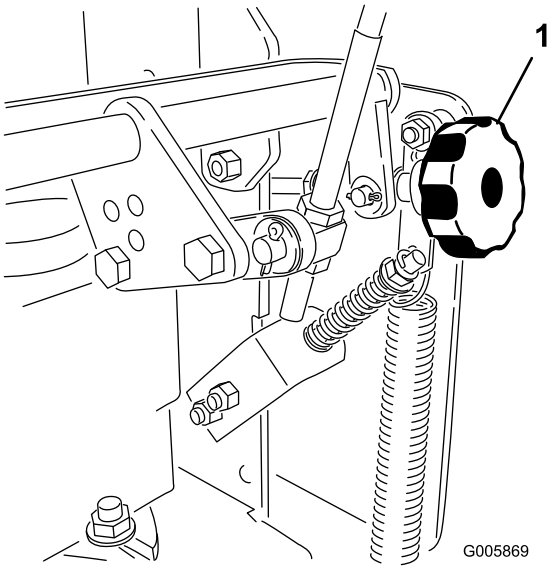



**Figure 55**

1. Quick track knob

## Adjusting the Traction Spring

The position of the traction spring is adjustable to increase the traction as attachments, such as a sulky or bagger, are added to the mower and excessively uneven terrain.

Use Figure 56 for the traction spring options.

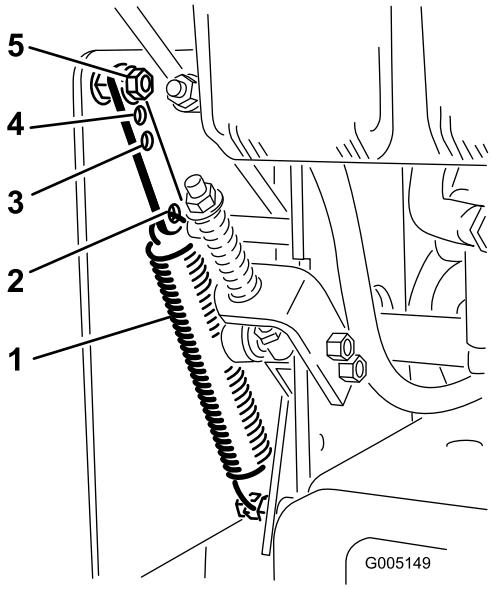



**Figure 56**

1. Traction spring
2. Left side linkage
3. Most traction for uneven terrain and attachments
4. Medium traction for moderate conditions
5. Standard traction for normal conditions

## Checking the Tire Pressure

Check the pressure at the valve stem after every 50 operating hours or monthly, whichever occurs first (Figure 57).

Maintain the air pressure in the rear tires at 14-16 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.

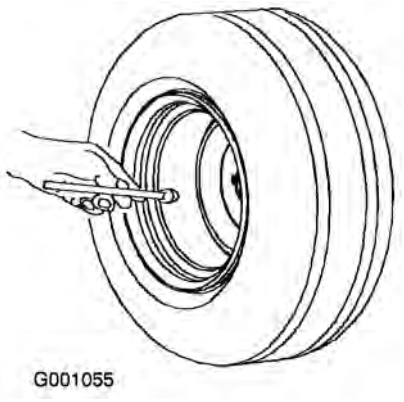



**Figure 57**

## Adjusting the Electric Clutch

The clutch is adjustable to ensure proper engagement and proper braking. Check adjustment after every 100 hours of operation.

1. Insert a 0.015–0.021 inch (0.381–0.533 mm) 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 lock nuts until there is slight binding on the feeler gauge but it can be moved easily within the air gap (Figure 58).
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.

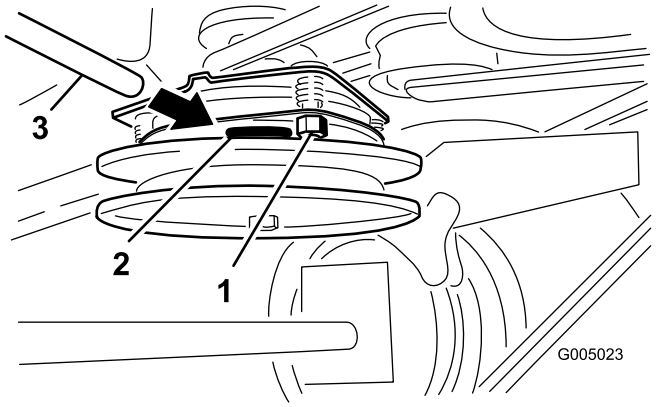



**Figure 58**

1. Adjusting nut
2. Slot
3. Feeler gauge

# *Cooling System Maintenance*

## Cleaning the Air Intake Screen

Before each use 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 insure adequate cooling and correct engine speed and will reduce the possibility of overheating and mechanical damage to the engine.

# *Brake Maintenance*

## Servicing the Brake

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

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

### Checking the Parking Brake

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. Setting the parking brake should take a reasonable amount of force. If the parking brake does not hold securely, an adjustment is required. Refer to Adjusting the Parking Brake.

   **Note:** When the brake is engaged, the brake handle should be in the 1 o'clock position.

### Adjusting the Brakes

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

1. Park the machine on a level surface, disengage the PTO, and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Check the brake before you adjust it; refer to Checking the Brakes.
4. Release the parking brake; refer to Releasing the Parking Brake in Operation, page 14.
5. Loosen the top and bottom jam nuts (Figure 59).
6. To adjust the brake, remove the hair pin cotter and clevis pin from the lower brake lever (Figure 59).
7. Rotate the brake rod in the yokes. To tighten the brake, lengthen the rod between the yokes. To loosen the brake, shorten the rod between the yokes (Figure 59).

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

8. Secure the yoke to lower brake lever with the hair pin cotter and clevis pin (Figure 59).
9. Tighten the top and bottom jam nuts (Figure 59).
10. Check the brake operation again; refer to Checking the Brake.

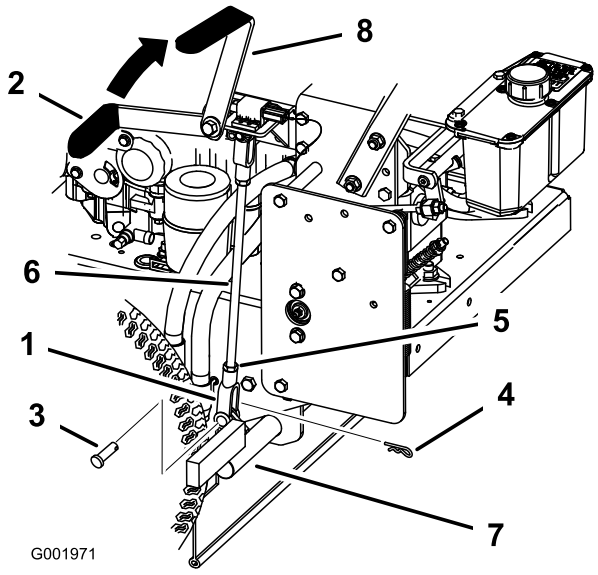



**Figure 59**

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

# *Belt Maintenance*

## Replacing the Mower Belt

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 60).
7. Install the new mower belt around the two outside spindle pulleys, the idler pulley, and in the lower groove of the double spindle pulley (Figure 60).
8. Connect the idler arm spring (Figure 60).
9. Install the PTO drive belt. Refer to Replacing the PTO Drive Belt.
10. Adjust the belt guide an 1/8 inch (3 mm) from the belt (Figure 60).
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.

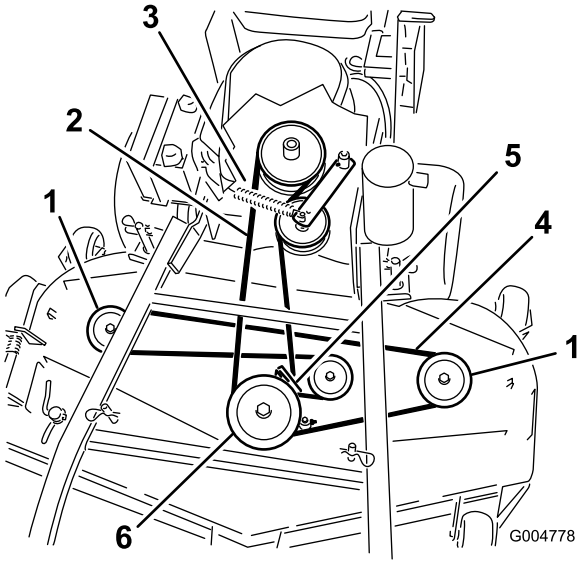



**Figure 60**

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

## Replacing the PTO Drive Belt

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 61). 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 61).
8. Install the new belt onto the engine pulley and spring loaded idler pulley (Figure 61).
9. Roll the belt onto the center pulley on the mower deck (Figure 61). 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 1/8 inch (3 mm) from the belt (Figure 61).
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.

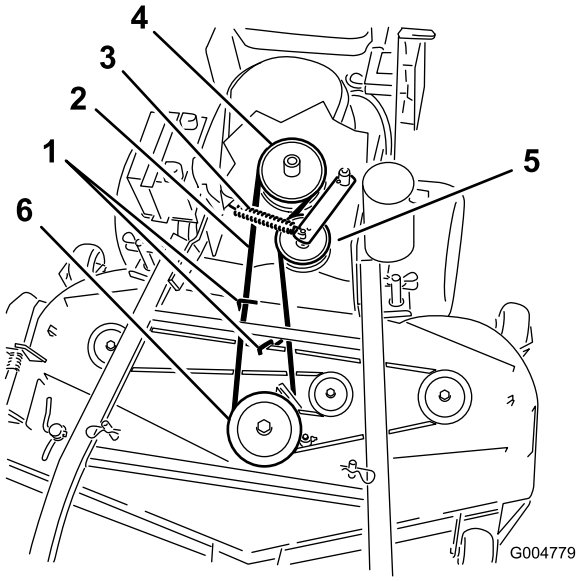



**Figure 61**

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

## Adjusting the PTO Drive Belt Idler Spring Anchor

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

Use Figure 62 for the idler position options.

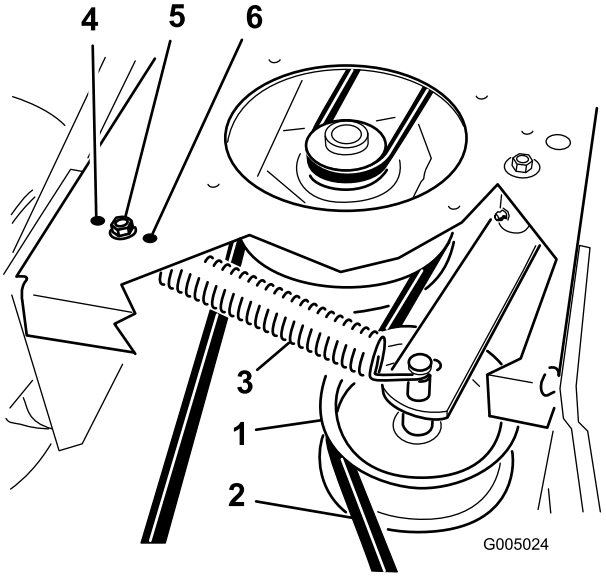



**Figure 62**

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

## Replacing the Pump 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. Remove PTO drive belt. Refer to Replacing the PTO Drive Belt in theBelt Maintenance, page 45.
4. Raise the machine and support it with jack stands.
5. Disconnect the clutch wire connector from the wire harness.
6. Disconnect the clutch retainer from the engine deck (Figure 63).

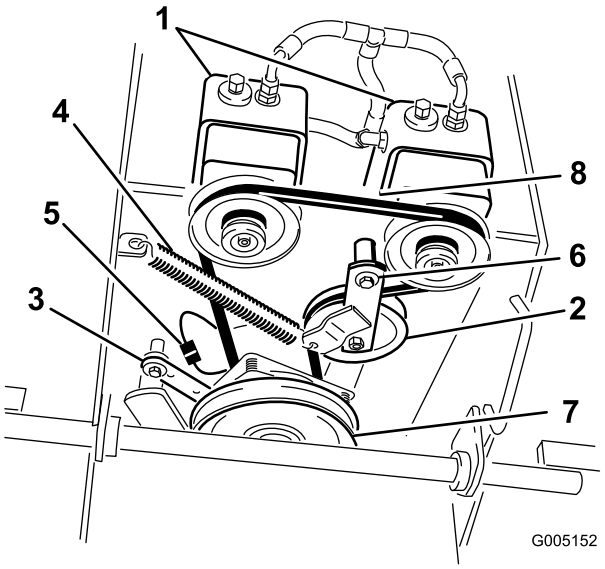



**Figure 63**

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

7. Unhook the idler spring from the frame (Figure 63).
8. Install the new belt around clutch and the two drive pulleys.
9. Install the idler spring between idler arm and frame bracket (Figure 63).
10. Install the clutch retainer to the engine deck (Figure 63).
11. Connect the clutch wire connector to the wire harness.
12. Install the PTO drive belt.

# *Hydraulic System Maintenance*

## Servicing the Hydraulic System

### Checking the Hydraulic Fluid

Check the hydraulic fluid level as follows:

- Check the hydraulic fluid level before engine is first started.
- Check the hydraulic fluid level after first 8 operating hours.
- Check the hydraulic fluid level after every 25 operating hours.

Fluid Type: Mobil 1 15W-50 synthetic motor oil or equivalent synthetic oil.

**Important: Use oil specified or equivalent. Other fluids could cause system damage.**

Hydraulic System Oil Capacity: 67 oz. (2.0 l)

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

1. Position machine on a level surface.
2. Disengage the power take off (PTO) and shut off the engine.
3. Wait for all moving parts to stop before leaving the operating position and then set the parking brake.
4. Clean area around cap and filler neck of hydraulic tank (Figure 64).

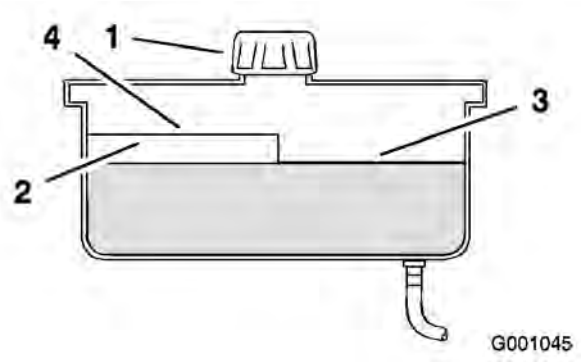



**Figure 64**

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

5. Remove cap from filler neck. Look inside to check the fluid level in the reservoir. (Figure 64).
6. Add fluid to the reservoir until it reaches the cold level of the baffle.
7. Run the machine at low idle for 15 minutes to allow any air to purge out of the system and warm fluid. Refer to Starting and Stopping the Engine.
8. Recheck the fluid level while the fluid is warm. If required, add fluid to the reservoir until it reaches the hot level of the baffle.

   **Note:** The fluid level should be to the top of the hot level of the baffle, when the fluid is warm (Figure 64).
9. Install cap on filler neck.

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

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

## Replacing the Hydraulic Filter

**Hot hydraulic fluid can cause severe burns.**

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

Change the hydraulic filter as follows:

- After the first 8 operating hours.
- After every 200 operating hours or yearly before storage.

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

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

3. Remove hydraulic reservoir cap and temporarily cover opening with a plastic bag and rubber band to prevent all hydro fluid from draining out.
4. Locate the filter under the fuel tank and place drain pan under filter (Figure 65).

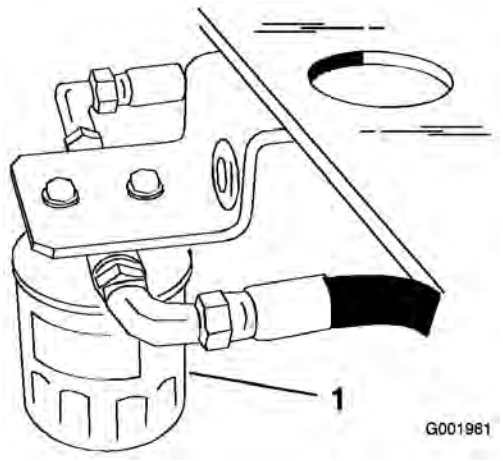



**Figure 65**

5. Remove the old filter and wipe the filter adapter gasket surface clean (Figure 66).
6. Apply a thin coat hydro fluid to the rubber gasket on the replacement filter.
7. Install replacement hydraulic filter onto the filter adapter. Do not tighten.
8. Remove plastic bag from reservoir opening and allow filter to fill with hydraulic fluid.
9. When the hydraulic filter is full, turn the oil filter clockwise until the rubber gasket contacts the filter adapter, then tighten the filter an additional 1/2 turn (Figure 66).

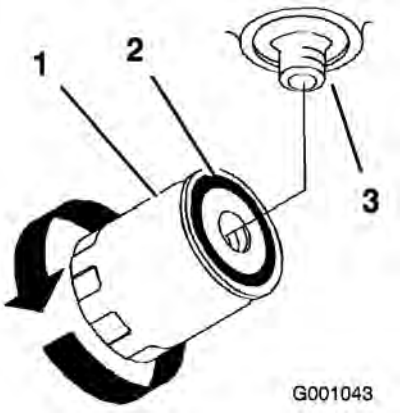



**Figure 66**

1. Hydraulic filter
2. Gasket
3. Adapter

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

**Important: Use oil specified or equivalent. Other fluids could cause system damage.**

12. Start engine and let run for about two minutes to purge air from the system. Stop the engine and check for leaks. If one or both wheels will not drive, refer to Bleeding Hydraulic System.
13. Recheck level and add fluid, if required. **Do not overfill.**

### Bleeding the Hydraulic System

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

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

   If the drive wheel does not rotate, it is possible to assist the purging of the system by carefully rotating the tire in the forward direction.
5. Check the hydraulic fluid level as it drops add fluid as required to maintain the proper level.
6. Repeat this procedure for the opposite wheel.
7. Thoroughly clean the area around each of the charge pump housings.

### Checking the Hydraulic Lines

After every 100 operating hours, check hydraulic lines and hoses for leaks, loose fittings, kinked lines, loose mounting supports, wear, weather and chemical deterioration. Make necessary repairs before operating.

**Note:** Keep areas around hydraulic system clean from grass and debris build up.

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

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

# *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.

**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

Inspect the blades every 8 hours.

1. Inspect the cutting edges (Figure 67). If the edges are not sharp or have nicks, remove and sharpen the blades. Refer to Sharpening the Blades.

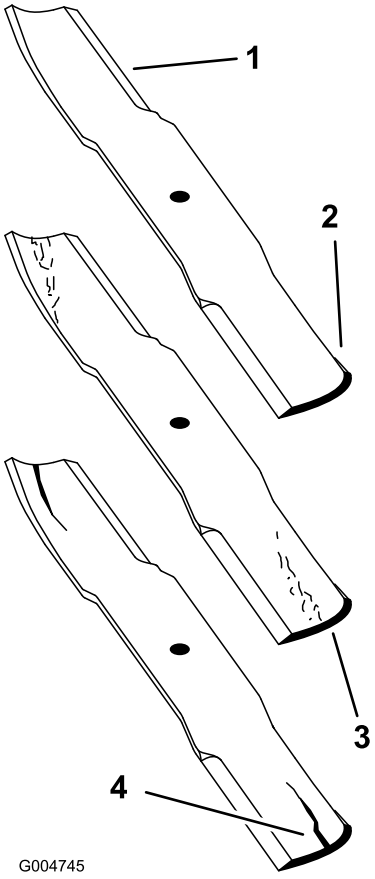



**Figure 67**

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 67). If you notice any cracks, wear, or a slot forming in this area (item 3 in Figure 67), immediately install a new blade.

## Checking for Bent Blades

1. Disengage the PTO, move the motion control levers to the neutral locked position and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Rotate the blades until the ends face forward and backward (Figure 68). Measure from a level surface to the cutting edge, position **A**, of the blades (Figure 68). Note this dimension.

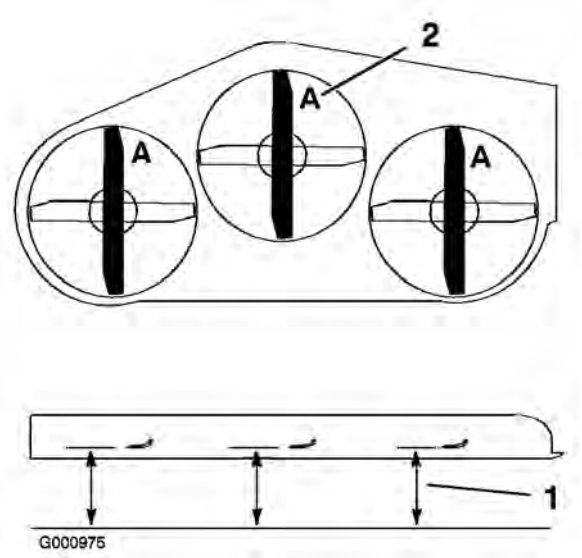



**Figure 68**

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

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

**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. Remove the blade bolt, curved washer, blade stiffener, and blade from the spindle shaft (Figure 69).

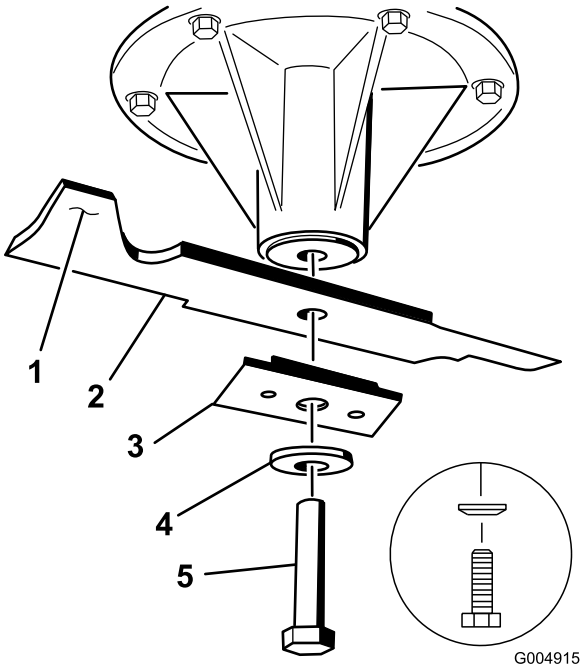



**Figure 69**

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

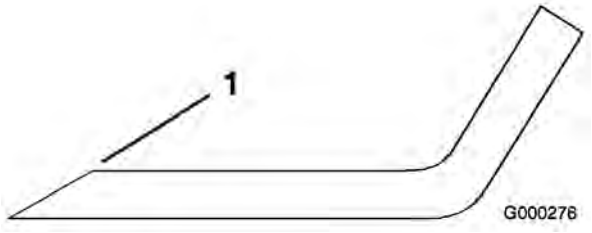



**Figure 70**

1. Sharpen at original angle

2. Check the balance of the blade by putting it on a blade balancer (Figure 71). If the blade stays in a horizontal position, the blade is balanced and can be used. If the blade is not balanced, file some metal off the end of the sail area only (Figure 69). Repeat this procedure until the blade is balanced.

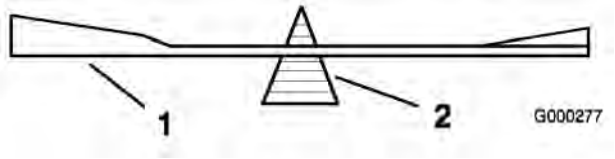



**Figure 71**

1. Blade
2. Balancer

## Installing the Blades

1. Install the blade onto the spindle shaft (Figure 69).

   **Important: The sail part of the blade must be pointing upward, toward the inside of the mower to ensure proper cutting (Figure 69).**

2. Install the blade, stiffener, curved washer, and blade bolt (Figure 69).
3. Torque the blade bolt to 85-110 ft-lb (115-140 N•m).

# 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. Disconnect the spark plug wire(s) from the spark plug(s).
3. Adjust the tire pressure in the rear tires to specifications; refer to Drive System Maintenance, page 36 .
4. Check that the blades and spindle shafts are not bent. Refer to Checking for Bent Blades.
5. Set the height-of-cut to the 4 inch (101.6 mm) position. Refer to Adjusting the Height-Of-Cut in Operation, page 14.
6. 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 72.
4. At the carrier frame cross channel, measure the height at location **A** (Figure 72). This measurement must be 1-5/16 inch (33 mm), plus or minus a 1/4 inch (6 mm).
5. If the height at location **A** is not correct, adjustment is needed.
6. Loosen the carrier frame mounting bolts on both sides of the machine (Figure 72).
7. Align the carrier frame and engine deck to match 1-5/16 inch (33 mm), plus or minus a 1/4 inch (6 mm) at location **A** (Figure 72).
8. Tighten the carrier frame mounting bolts on both sides of the machine.

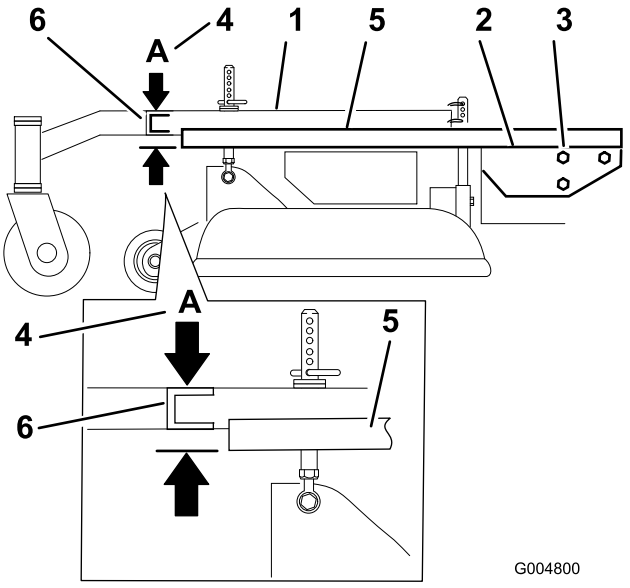



**Figure 72**

1. Carrier Frame
2. Top of engine deck
3. Carrier frame mounting bolts
4. Location A, 1-5/16 inch (33 mm) ±1/4 inch (6 mm)
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 36 .
4. Measure engine deck height at location **A** (Figure 73).

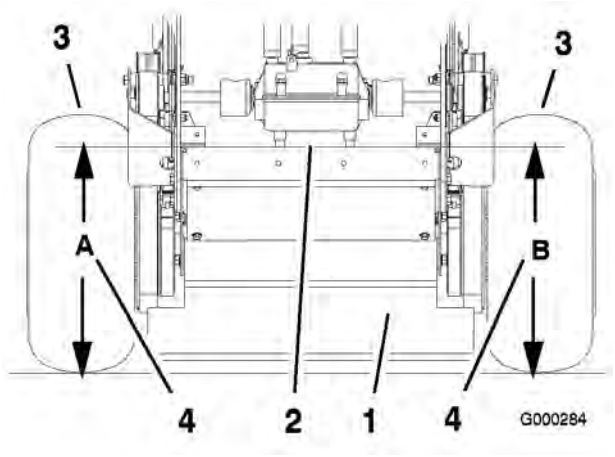



**Figure 73**

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

5. Measure engine deck height at location **B** (Figure 73).
6. If the height at location **A** and **B** are not the same, change tire pressure slightly to make them the same.

## Checking the Carrier Frame Front-to-Rear Pitch

The carrier frame must have a pitch between 1/8 inch (3 mm) to 3/8 inch (9 mm) over the length of 24 inches (61 cm) on the carrier frame (Figure 74).

1. Measure out 24 inches (61 cm) on the carrier frame (Figure 74).

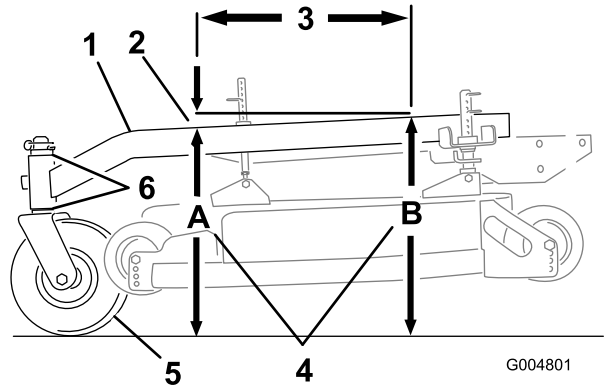



**Figure 74**

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

2. Measure carrier frame height at location **A** (Figure 74).
3. Measure carrier frame height at location **B** (Figure 74).
4. The height at location **A** must be an 1/8-3/8 inch (3 mm -10 mm) lower than location **B** (Figure 74).
5. If the carrier frame is not correct, move caster spacers to make it an 1/8-3/8 inch (3 -10 mm) pitch (Figure 74). Move spacers from top or bottom to make the correct pitch.
6. The tire pressure may also be adjusted slightly to make an 1/8-3/8 inch (3 -10 mm) pitch.

## Checking the Carrier Frame Side-to-Side Height

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

1. Disengage the PTO and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Adjust the tire pressure in the rear tires to specifications; refer to Drive System Maintenance, page 36 .
4. Measure carrier frame height at location **A** (Figure 75).
5. Measure carrier frame height at location **B** (Figure 75).
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.

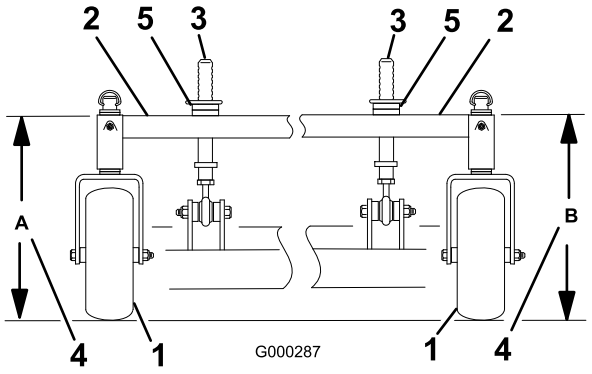



**Figure 75**

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

## 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 36 .
2. Position one blade front-to-rear. Measure at **A** and **B** locations from a level surface to the cutting edge of the blade tips (Figure 76).
3. The mower blade should be a 1/4 inch (6 mm) lower in front at **A** than in the rear at **B**. Rotate blades and repeat for other blades. If it is not correct, proceed to Changing the Deck Front-to-Rear Pitch.

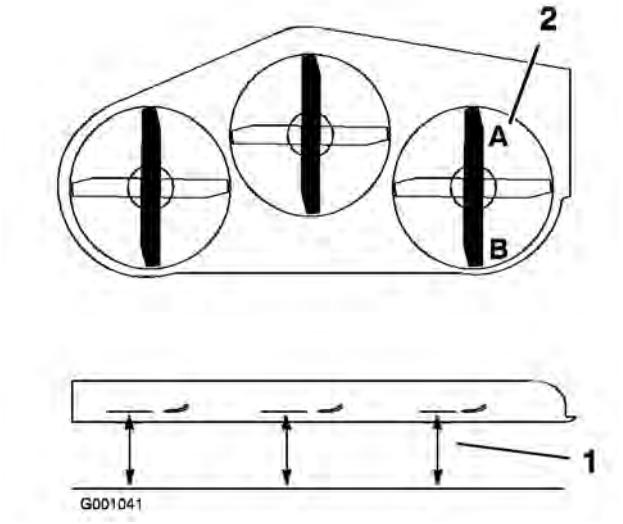



**Figure 76**

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 77).

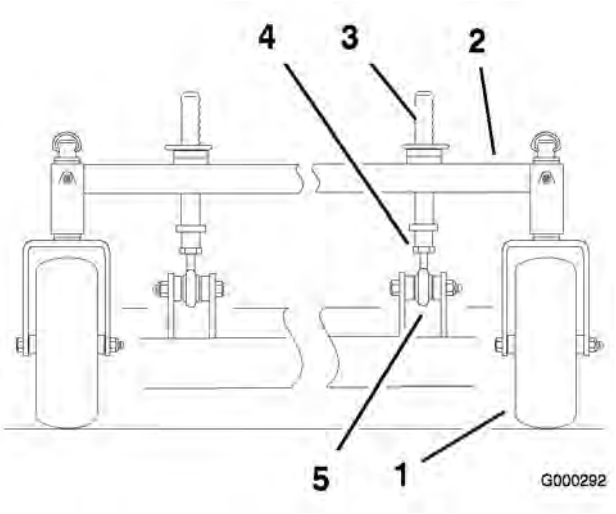



**Figure 77**

1. Caster Wheel
2. Carrier Frame
3. Front height-of-cut pins
4. Jam nut
5. Ball joint

2. To raise the front of the deck, loosen jam nut and rotate the front pin clockwise (Figure 77).
3. To lower the front of the deck, loosen jam nut and rotate the front pin counter clockwise (Figure 77).
4. Position the blades front-to-rear. Measure at C and D locations (Figure 76) from a level surface to the cutting edge of the blades.
5. Check the side-to-side leveling of the cutting unit.
6. Tighten the jam nuts (Figure 77).

## Checking the Mower Deck Side-to-Side Height

1. Adjust the rear tire pressure to specifications; refer to Drive System Maintenance, page 36 .
2. Position the blades side-to-side. Measure at **C** and **D** locations from a level surface to the cutting edge of blade tips (Figure 78).

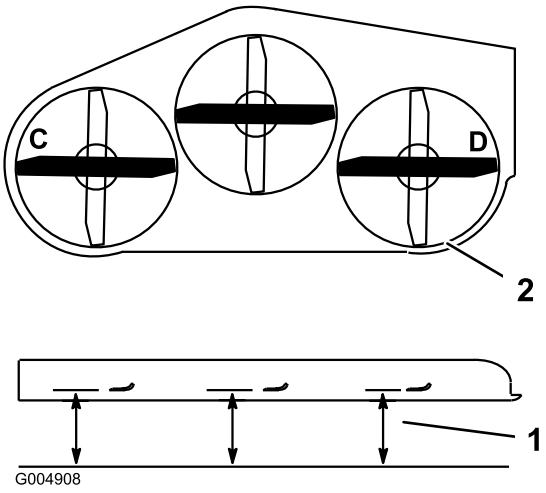



**Figure 78**

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

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

## 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. 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 4 inch (101.6 mm) position following the height-of-cut decal.
3. With the machine on level surface, position one blade front-to-rear. Measure at **A** and from level surface to the cutting edge of the blade tips (Figure 79).

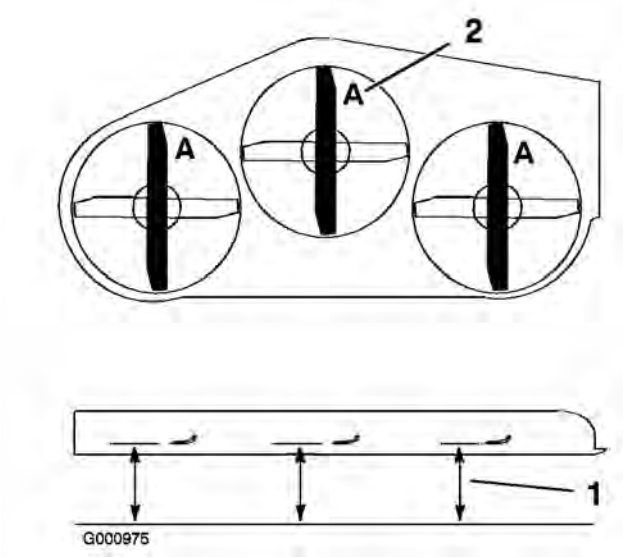



**Figure 79**

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

4. The measurement should be 4 inch (101.6 mm).
5. 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.
6. Check the carrier frame front-to-rear pitch.

## Replacing the Grass Deflector

**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 80). Remove damaged or worn grass deflector.

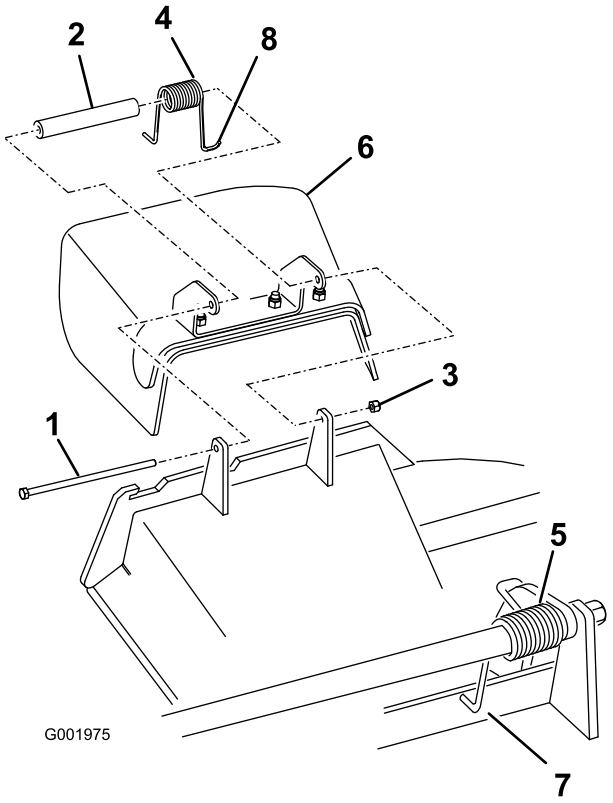



**Figure 80**

1. Bolt
2. Spacer
3. Locknut
4. Spring
5. Spring installed
6. Grass Deflector
7. L end of spring, place behind deck edge before installing bolt
8. J hook end of spring

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

   **Note:** Make sure the L end of spring is installed behind deck edge before installing the bolt as shown in Figure 80.

3. Install bolt and nut. Place the **J** hook end of spring around grass deflector (Figure 80).

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

# *Cleaning*

## Cleaning Under the Mower

Remove the grass buildup under the mower daily.

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

## Waste Disposal

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

# Storage

## Cleaning and 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 drive system and engine. Pressure washing can force dirt and water into critical parts, such as spindle bearings and electrical switches.**
3. Check the brake; refer to Servicing the Brake in Brake Maintenance, page 44.
4. Service the air cleaner; refer to Servicing the Air Cleaner in Engine Maintenance, page 29.
5. Grease the machine; refer to Greasing and Lubrication in Lubrication, page 27.
6. Change the engine oil; refer to Servicing the Engine in Engine Maintenance, page 29.
7. Check the tire pressure; refer to Checking the Tire Pressure in Drive System Maintenance, page 36.
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 32, 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 29. 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.

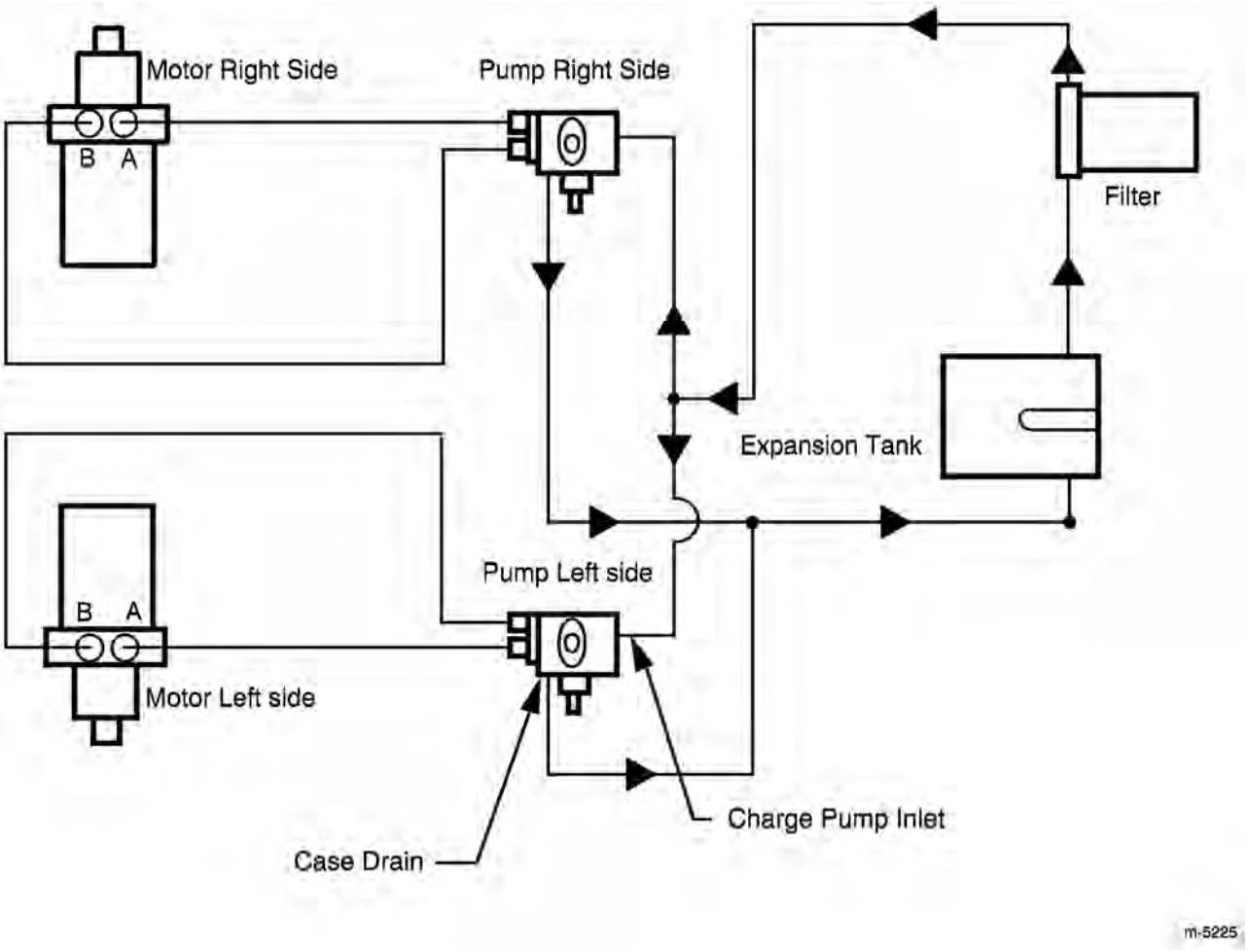
# Troubleshooting

| Problem | Possible Cause | Corrective Action |
|---|---|---|
| Engine will not start, starts hard, or fails to keep running. | 1. Fuel tank is empty. | 1. Fill fuel tank with gasoline. |
| | 2. Choke is not on. | 2. Move the choke lever to choke position. |
| | 3. Air cleaner is dirty. | 3. Service the air cleaner element. |
| | 4. Spark plug wire is loose or disconnected. | 4. Install wire on spark plug. |
| | 5. Spark plug is pitted, fouled, or the gap is incorrect. | 5. Install a new, correctly gapped spark plug. |
| | 6. Dirt in the fuel filter. | 6. Replace the fuel filter. |
| | 7. Dirt, water, or stale fuel is in the fuel system. | 7. Contact an Authorized Service Dealer. |
| Engine loses power. | 1. Engine load is excessive. | 1. Reduce the ground speed. |
| | 2. Air cleaner is dirty. | 2. Service the air cleaner. |
| | 3. Oil level in the crankcase is low. | 3. Add oil to the crankcase. |
| | 4. Cooling fins and air passages under the engine blower housing are plugged. | 4. Remove the obstruction from the cooling fins and air passages. |
| | 5. Spark plug is pitted, fouled, or the gap is incorrect. | 5. Install a new, correctly gapped spark plug. |
| | 6. Vent hole in the fuel cap is plugged. | 6. Clean or replace the fuel cap. |
| | 7. Dirt in the fuel filter. | 7. Replace the fuel filter. |
| | 8. Dirt, water, or stale fuel is in the fuel system. | 8. Contact an Authorized Service Dealer. |
| Engine overheats. | 1. Engine load is excessive. | 1. Reduce the ground speed. |
| | 2. Oil level in the crankcase is low. | 2. Add oil to the crankcase. |
| | 3. Cooling fins and air passages under the engine blower housing are plugged. | 3. Remove the obstruction from the cooling fins and air passages. |

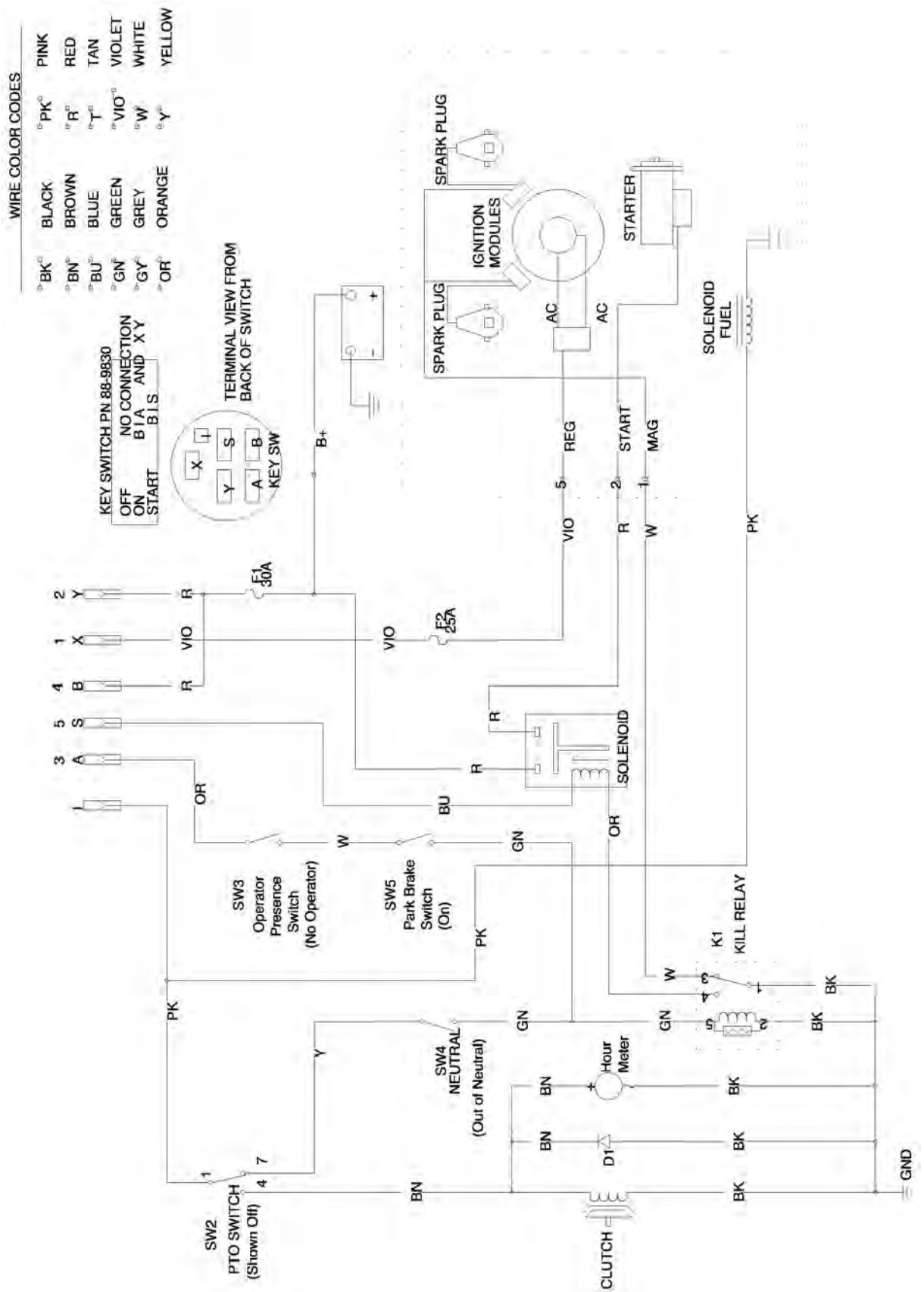
| Problem | Possible Cause | Corrective Action |
|---|---|---|
| Machine does not drive. | 1. Speed control lever is in neutral. | 1. Move the speed control lever to a forward position. |
| | 2. Neutral locks engaged. | 2. Disengage the neutral locks. |
| | 3. Hydraulic oil reservoir low. | 3. Add hydraulic oil to the reservoir. |
| | 4. Air in the hydraulic system. | 4. Bleed the air out the hydraulic system. |
| | 5. Pump drive belt slipping. | 5. Replace the pump drive belt. |
| | 6. Pump drive belt idler spring missing. | 6. Replace the pump drive belt idler spring. |
| Abnormal vibration. | 1. Cutting blade(s) is/are bent or unbalanced. | 1. Install new cutting blade(s). |
| | 2. Blade mounting bolt is loose. | 2. Tighten the blade mounting bolt. |
| | 3. Engine mounting bolts are loose. | 3. Tighten the engine mounting bolts. |
| | 4. Loose engine pulley, idler pulley, or blade pulley. | 4. Tighten the appropriate pulley. |
| | 5. Engine pulley is damaged. | 5. Contact an Authorized Service Dealer. |
| | 6. Blade spindle is bent. | 6. Contact an Authorized Service Dealer. |
| Uneven cutting height. | 1. Blade(s) not sharp. | 1. Sharpen the blade(s). |
| | 2. Cutting blade(s) is/are bent. | 2. Install new cutting blade(s). |
| | 3. Mower is not level. | 3. Level the mower side-to-side position. |
| | 4. Mower pitch is wrong. | 4. Adjust the front-to-rear pitch. |
| | 5. Underside of mower is dirty. | 5. Clean the underside of the mower. |
| | 6. Tire pressure is not correct. | 6. Adjust the tire pressure. |
| | 7. Blade spindle bent. | 7. Contact an Authorized Service Dealer. |

| Problem | Possible Cause | Corrective Action |
|---|---|---|
| Blades do not rotate. | 1. Drive belt is worn, loose or broken. | 1. Check the belt tension. |
| | 2. Drive belt is off pulley. | 2. Install drive belt and check adjusting shafts and belt guides for correct position. |
| | 3. Deck belt is worn, loose or broken. | 3. Install new deck belt. |
| | 4. Deck belt is off pulley. | 4. Install deck pulley and check the idler pulley, idler arm and spring for correct position and function. |
| | 5. Broken or missing idler spring. | 5. Replace the spring. |
| | 6. Electric clutch out of adjustment. | 6. Adjust the clutch air gap. |
| | 7. Clutch connector or wire damaged. | 7. Contact an Authorized Service Dealer. |
| | 8. Damaged electric clutch. | 8. Contact an Authorized Service Dealer. |
| | 9. Safety interlock system prevents blade rotation. | 9. Contact an Authorized Service Dealer. |
| | 10. PTO switch is faulty. | 10. Contact an Authorized Service Dealer. |

# Schematics




**Hydraulic Schematic (Rev. A)**




**Electrical Schematic (Rev. A)**

# Evaporative Emission Control Warranty Statement

California Evaporative Emission Control Warranty Statement
Your Warranty Rights and Obligations

## Introduction

The California Air Resources Board and The Toro® Company are pleased to explain the evaporative emission control system's warranty on your 2007 model year equipment. In California, new equipment that use small off-road engines must be designed, built, and equipped to meet the State's stringent anti-smog standards. The Toro® Company must warrant the evaporative emission control system on your equipment for two years provided there has been no abuse, neglect or improper maintenance of your equipment.

Your evaporative emission control system may include parts such as: fuel lines, fuel line fittings, and clamps.

## Manufacturer's Warranty Coverage:

This evaporative emission control system is warranted for two years. If any evaporative emission-related part on your equipment is defective, the part will be repaired or replaced by The Toro® Company.

## Owner's Warranty Responsibilities:

- As the equipment owner, you are responsible for performance of the required maintenance listed in your Operator's Manual. The Toro® Company recommends that you retain all receipts covering maintenance on your equipment, but The Toro® Company cannot deny warranty solely for the lack of receipts.
- As the equipment owner, you should however be aware that The Toro® Company may deny you warranty coverage if your emission warranty parts have failed due to abuse, neglect, or improper maintenance or unapproved modifications.
- You are responsible for presenting your equipment to an Authorized Service Dealer as soon as the problem exists. The warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days. If you have a question regarding your warranty coverage, you should contact The Toro® Company at 1-952–948–4027 or call us toll free at the number listed in your Toro Warranty statement.

## Defects Warranty Requirements:

1. The warranty period begins on the date the engine or equipment is delivered to an ultimate purchaser.
2. General Evaporative Emissions Warranty Coverage. The emission warranty parts must be warranted to the ultimate purchaser and any subsequent owner that the evaporative emission control system when installed was:
   A. Designed, built, and equipped so as to conform with all applicable regulations; and
   B. Free from defects in materials and workmanship that causes the failure of a warranted part for a period of two years.
3. The warranty on evaporative emissions-related parts will be interpreted as follows:
   A. Any warranted part that is not scheduled for replacement as required maintenance in the written instructions must be warranted for the warranty period of two years. If any such part fails during the period of warranty coverage, it must be repaired or replaced by The Toro® Company. Any such part repaired or replaced under the warranty must be warranted for a time not less than the remaining warranty period.
   B. Any warranted part that is scheduled only for regular inspection in the written instructions must be warranted for the warranty period of two years. A statement in such written instructions to the effect of "repair or replace as necessary" will not reduce the period of warranty coverage. Any such part repaired or replaced under warranty must be warranted for a time not less than the remaining warranty period.
   C. Any warranted part that is scheduled for replacement as required maintenance in the written instructions must be warranted for the period of time prior to the first scheduled replacement point for that part. If the part fails prior to the first scheduled replacement, the part must be repaired or replaced by The Toro® Company. Any such part repaired or replaced under warranty must be warranted for a time not less than the remainder of the period prior to the first scheduled replacement point for the part.
   D. Repair or replacement of any warranted part under the warranty provisions of this article must be performed at no charge to the owner at an Authorized Service Dealer.
   E. Notwithstanding the provisions of subsection (D) above, warranty services or repairs must be provided at an Authorized Service Dealer.
   F. The owner must not be charged for diagnostic labor that leads to the determination that a warranted part is in fact defective, provided that such diagnostic work is performed at an Authorized Service Dealer.
   G. Throughout the evaporative emission control system's two year warranty period, The Toro® Company must maintain a supply of warranted parts sufficient to meet the expected demand for such parts.
   H. Manufacturer approved replacement parts must be used in the performance of any warranty maintenance or repairs and must be provided without charge to the owner. Such use will not reduce the warranty obligations of The Toro® Company.
   I. The use of any add-on or modified parts will be grounds for disallowing a warranty claim made in accordance with this article. The Toro® Company will not be liable under this Article to warrant failures of warranted parts caused by the use of an add-on or modified part.
   J. The Toro® Company shall provide any documents that describe the warranty procedures or policies within five working days of request by the Air Resources Board.

## Emission Warranty Parts List:

The following lists includes the parts covered under this warranty:

- Fuel Lines
- Fuel Line Fittings
- Clamps

LCE

# The Toro Total Coverage Guarantee

A Limited Warranty

## Conditions and Products Covered

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

This warranty applies to:

- ProLine Mid-Size Walk Power Mowers and Accessories
- Z Master Mid-Mount ZRTs and Accessories
- Z Master Outfront ZRTs and Accessories
- Groundsmaster 120 OFRs and Accessories

The following time periods apply from the date of purchase:

| Components | Warranty Period |
|---|---|
| Engines | 2 years |
| Hydraulic Systems | 2 years |
| Traction Unit Frame | 2 years |
| Carrier Frame | 2 years |
| Deck Shells | 2 years |
| Deck Spindles | 3 years Parts<br>2 years Labor |
| Z500 Series Clutches | 2 years |
| Remaining Components | 1 year |

This warranty includes the cost of parts and labor, but you must pay transportation costs.

Some engines used on Toro LCE 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 Toro Authorized or Master Service Dealer to arrange service at their dealership. To locate a dealer convenient to you, access our website at www.Toro.com. You may also call our Toro Customer Care Department toll free at 888–577–7466 (U.S. customers) or 877–484–9255 (Canada customers).
2. Bring the product and your proof of purchase (sales receipt) to the Service Dealer.

If for any reason you are dissatisfied with the Service Dealer's analysis or with the assistance provided, contact us at:

## 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 on some products. This express warranty does not cover the following:

- Cost of regular maintenance service or parts, such as filters, fuel, lubricants, tune-up parts, blade sharpening, brake and clutch adjustments.
- Any product or part which has been altered or misused or required replacement or repair due to normal wear, accidents, or lack of proper maintenance.
- Repairs necessary due to improper fuel, contaminants in the fuel system, or failure to properly prepare the fuel system prior to any period of non-use over three months.
- Pickup and delivery charges.

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

## General Conditions

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

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

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.

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.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

LCB Customer Service Department
Toro Warranty Company
8111 Lyndale Avenue South
Bloomington, MN 55420-1196
888-577-7466 (U.S. customers)
877-484-9255 (Canada customers)

## Countries Other than the United States or Canada

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