



Count on it.

Operator's Manual

GrandStand™ Mower

with a 48in or 52in TURBO FORCE® Cutting Unit

Model No. 74558—Serial No. 290000001 and Up

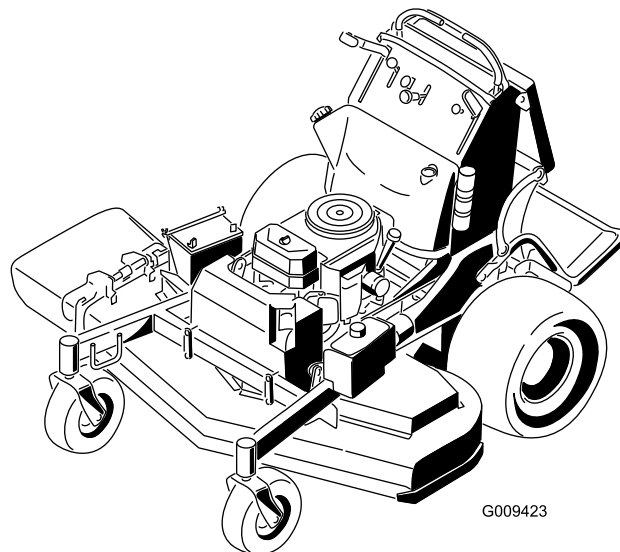
Model No. 74559—Serial No. 290000001 and Up

Model No. 74568—Serial No. 290000001 and Up

Model No. 74569—Serial No. 290000001 and Up

Model No. 79558—Serial No. 290000001 and Up

Model No. 79559—Serial No. 290000001 and Up



G009423

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.

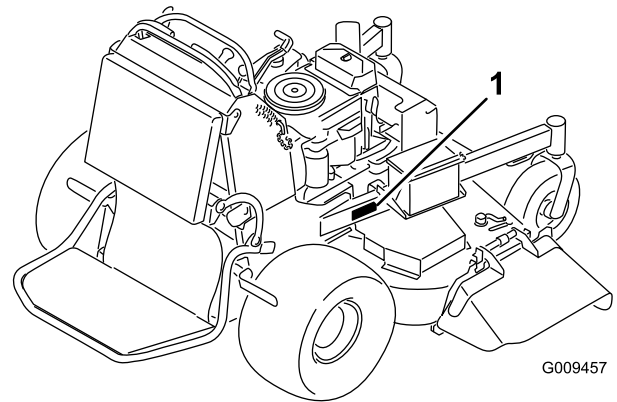


Figure 1

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

Introduction.....	2
Safety	4
Safe Operating Practices	4
Toro Mower Safety	5
Slope Chart	7
Safety and Instructional Decals	8
Product Overview	11
Controls	11
Specifications	12
Operation.....	13
Adding Fuel	13
Checking the Engine Oil Level.....	14
Breaking In a New Machine	14

Think Safety First	14	Controls System Maintenance.....	45
Operating the Parking Brake	14	Adjusting the Motion Control Handle	
Operating the Mower Blade Control Switch		Positions	45
(PTO)	15	Hydraulic System Maintenance	47
Operating the Throttle	15	Servicing the Hydraulic System	47
Operating the Choke	15	Mower Deck Maintenance	49
Operating the Ignition Switch	16	Servicing the Cutting Blades	49
Using the Speed Control Lever	16	Correcting the Mower Quality of Cut	51
Using the Fuel Shut-Off Valve	16	Replacing the Grass Deflector.....	54
Starting and Stopping the Engine	17	Cleaning.....	55
The Safety Interlock System.....	18	Cleaning Under the Mower	55
Operating the Platform	19	Waste Disposal	55
Driving Forward or Backward.....	20	Storage.....	55
Stopping the Machine.....	21	Cleaning and Storage	55
Pushing the Machine by Hand.....	21	Troubleshooting.....	57
Transporting Machines.....	22	Schematics	59
Loading Machines	22		
Side Discharging or Mulching the Grass	23		
Adjusting the Height-of-Cut	23		
Adjusting the Flow Baffle	23		
Positioning the Flow Baffle.....	24		
Using the Mid-Size Weight.....	25		
Maintenance.....	26		
Recommended Maintenance Schedule(s)	26		
Premaintenance Procedures.....	27		
Raising the Mower for Access	27		
Remove the Cushion for Rear Access	28		
Lubrication.....	29		
How to Grease	29		
Lubricating the Machine	29		
Engine Maintenance.....	30		
Servicing the Air Cleaner	30		
Servicing the Engine Oil.....	31		
Servicing the Spark Plug	34		
Fuel System Maintenance	35		
Draining the Fuel Tank.....	35		
Servicing the Fuel Filter.....	36		
Electrical System Maintenance.....	36		
Servicing the Battery.....	36		
Servicing the Fuses	38		
Drive System Maintenance	39		
Adjusting the Tracking	39		
Checking the Tire Pressure	40		
Adjusting the Caster Pivot Bearing	40		
Servicing the Caster Wheel and Bearings	40		
Adjusting the Electric Clutch	41		
Cooling System Maintenance.....	41		
Cleaning the Air Intake Screen	41		
Cleaning the Cooling System.....	41		
Brake Maintenance	42		
Servicing the Brake.....	42		
Belt Maintenance.....	43		
Replacing the Mower Deck Belt	43		
Replacing the Pump Drive Belt	44		

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.
- Slow down before making turns and use extra caution.
- Use caution when riding the platform over curbs, rocks, roots, or other obstructions.
- Look behind and down before backing up to be sure of a clear path. Use extra care when operation in reverse.
- Never jerk the controls; use a steady motion.

Slope Operation

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

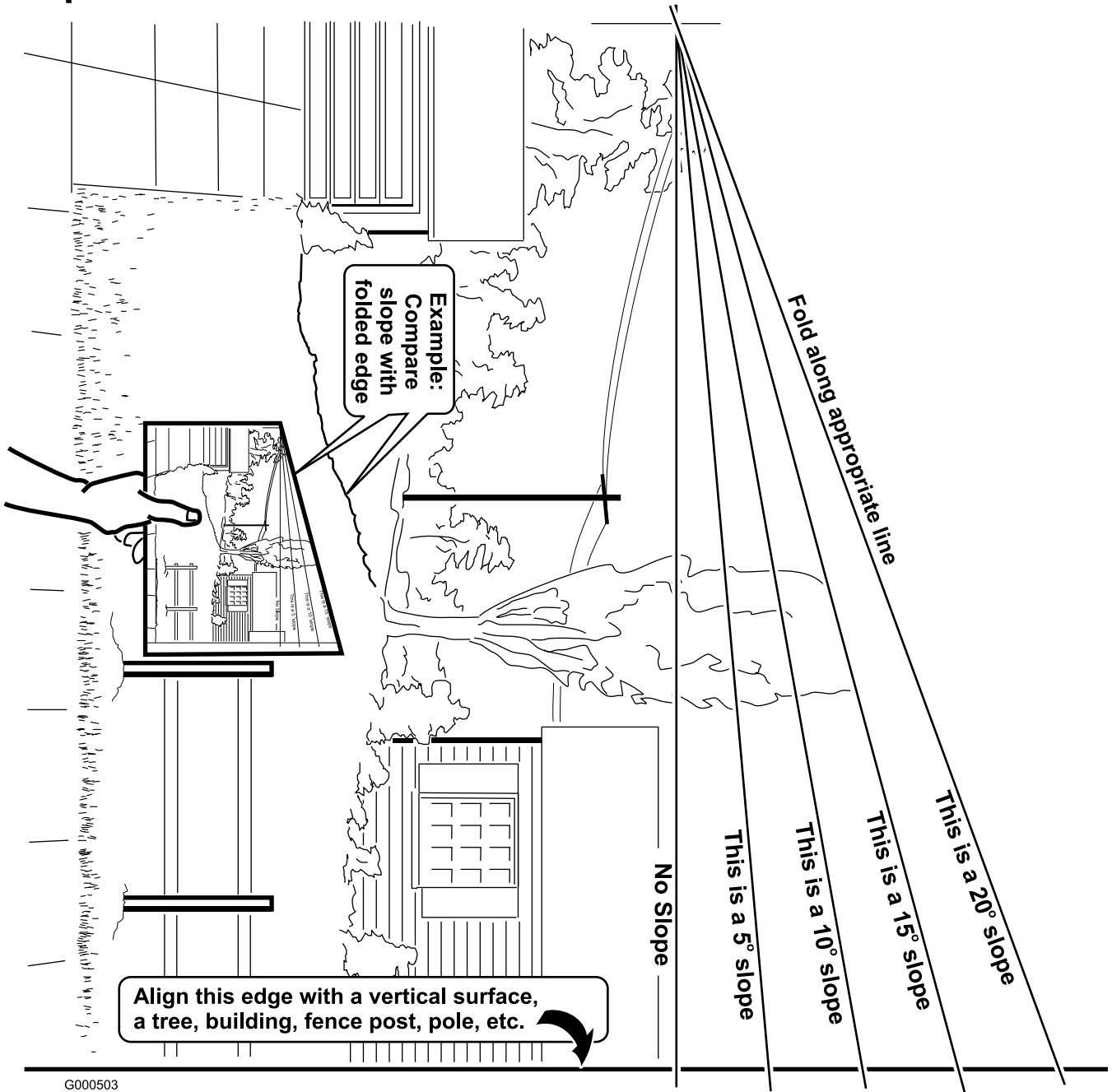
- Remove obstacles such as rocks, tree limbs, etc. from the mowing area.
- Watch for holes, ruts or bumps. Tall grass can hide obstacles.
- Use caution near drop-offs, ditches, or embankments. The machine could suddenly turn over if a wheel goes over the edge of a cliff or ditch, or if an edge caves in.
- Use extra care with grass catchers or other attachments. These can change the stability of the machine.
- Keep all movement on slopes slow and gradual. Do not make sudden changes in speed or direction.
- Mow slopes side to side.
- Do not mow slopes greater than 20 degrees.

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



G000503

Safety and Instructional Decals



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



1-403005



1-523552



54-9220



68-8340



98-5954



Battery Symbols

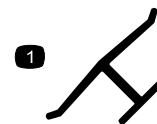
Some or all of these symbols are on your battery

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.



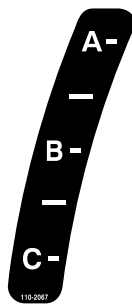
106-5517

1. Warning—do not touch the hot surface.

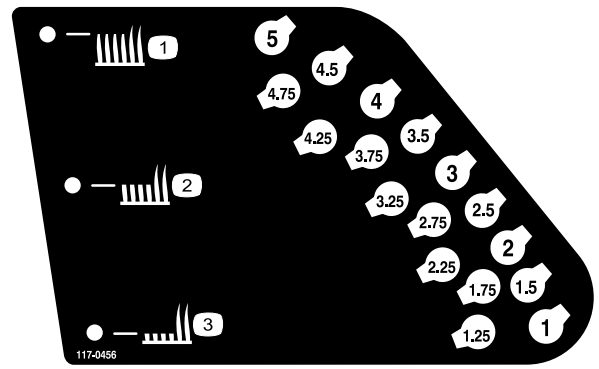


Manufacturer's Mark

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



110-2067



117-0456

1. Height of cut (HOC)—high
2. Height of cut (HOC)—medium
3. Height of cut (HOC)—low

ADJUSTABLE BAFFLE BAFLE AJUSTABLE

<p>A -</p> <ul style="list-style-type: none"> • Short, light grass • Dry conditions • Maximum dispersion 		<p>• <i>Césped corto y ligero</i></p> <p>• <i>Condiciones secas</i></p> <p>• <i>Maxima dispersion</i></p>
<p>B -</p> <ul style="list-style-type: none"> • Bagging setting 		<p>• <i>Posicion para usar con bolsa</i></p>
<p>C -</p> <ul style="list-style-type: none"> • Tall, dense grass • Wet conditions • Maximum ground speed 		<p>• <i>Césped alto y denso</i></p> <p>• <i>Condiciones mojadas</i></p> <p>• <i>Maxima velocidad</i></p>

110-2068

110-2068

1. Read the *Operator's Manual*.

SERVICE AID

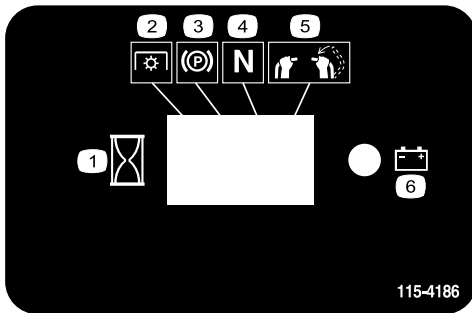
<p>EVERY 8 HOURS (DAILY):</p> <ul style="list-style-type: none"> • CLEAN UNDER MOWER DECK • CHECK AND SHARPEN BLADES • CHECK ENGINE OIL LEVEL 	<p>EVERY 200 HOURS:</p> <ul style="list-style-type: none"> • CHANGE ENGINE OIL FILTER • GREASE BLADE SPINDLES (3) • GREASE LIFT LINKAGE PIVOTS (7)
<p>EVERY 50 HOURS (WEEKLY):</p> <ul style="list-style-type: none"> • CLEAN ALL DIRTY AREAS • CHECK ENGINE AIR FILTER • CHECK HYDRAULIC OIL LEVEL • CHECK TIRE PRESSURE - 13 PSI 	<p>EVERY 400 HOURS:</p> <ul style="list-style-type: none"> • CHANGE FUEL FILTER • CHANGE ENGINE AIR FILTER • CHANGE HYDRAULIC OIL FILTER • CHECK BATTERY ELECTROLYTE LEVEL
<p>EVERY 100 HOURS:</p> <ul style="list-style-type: none"> • CHANGE ENGINE OIL • CHECK SPARK PLUG GAP • CHECK BELTS 	<p>EVERY 800 HOURS (YEARLY):</p> <ul style="list-style-type: none"> • CHANGE HYDRAULIC OIL • GREASE FRONT CASTER PIVOTS • GREASE FRONT WHEEL BEARINGS

See operator's manual for additional details.

SERVICE MORE OFTEN IN DIRTY OR DUSTY CONDITIONS

117-0485

117-0485



115-4186

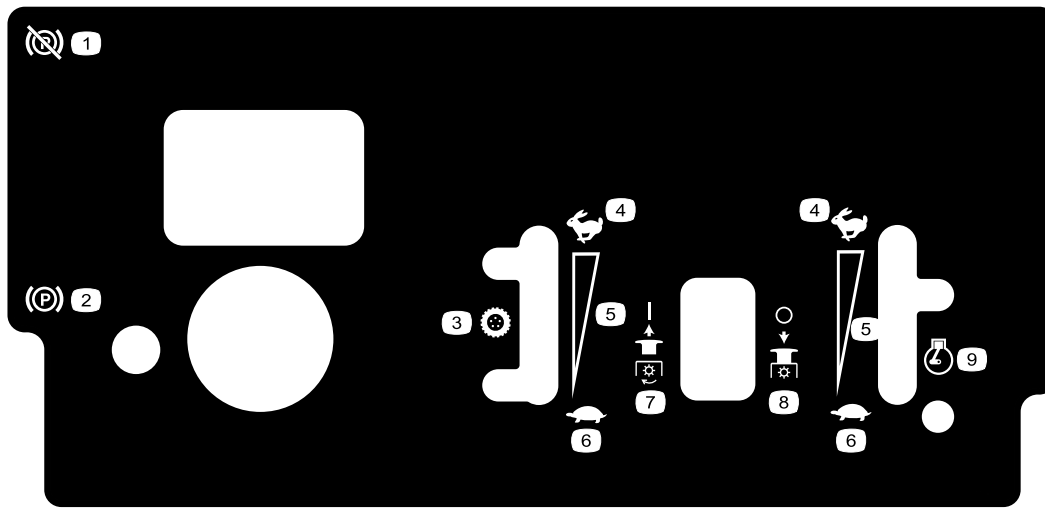
1. Interval
2. Power Take-off (PTO)
3. Parking brake
4. Neutral
5. Operator presence switch
6. Battery

BELT TENSION ADJUSTMENT:

5.75" HOOK TO HOOK STRETCHED SPRING LENGTH

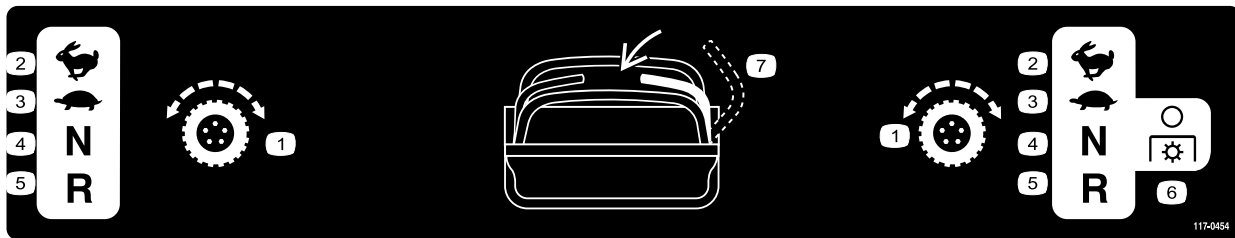
117-0486

117-0486



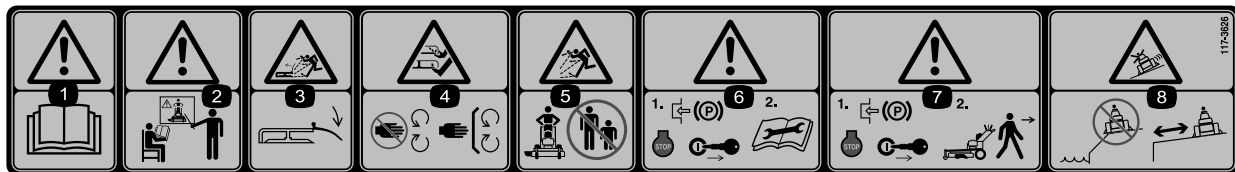
117-0453

- | | | | |
|----------------------------|--------------------------------|-----------------------------------|------------------------------|
| 1. Parking brake—disengage | 5. Fast | 9. Power Take-off (PTO)—disengage | 13. Height of cut (HOC)—high |
| 2. Parking brake—engage | 6. Continuous variable setting | 10. Engine speed | |
| 3. Choke | 7. Slow | 11. Height of cut (HOC)—low | |
| 4. Speed control lever | 8. Power Take-off (PTO)—engage | 12. Height of cut (HOC)—medium | |



117-0454

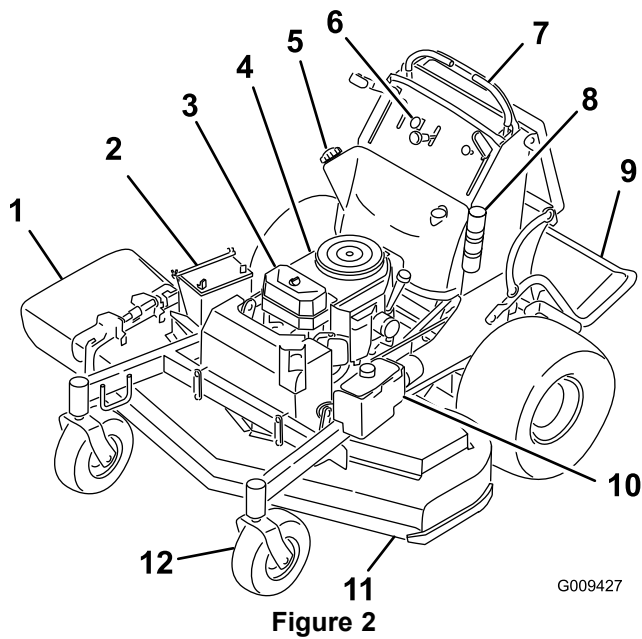
- | | | | |
|---------------------|------------|-----------------------------------|-----------------------------|
| 1. Traction control | 3. Slow | 5. Reverse | 7. Operator presence switch |
| 2. Fast | 4. Neutral | 6. Power Take-off (PTO)—disengage | |



117-3626

- | | |
|--|---|
| 1. Warning—read the <i>Operator's Manual</i> . | 5. Thrown object hazard—keep bystanders a safe distance from the machine. |
| 2. Warning—do not operate this machine unless you are trained. | 6. Warning—engage the parking brake, stop the engine and remove the spark plug wire before performing any maintenance on the machine. |
| 3. Thrown object hazard—keep deflector in place. | 7. Warning—engage the parking brake and stop the engine before leaving the machine. |
| 4. Cutting, dismemberment hazard of hand or foot—stay away from moving parts and keep all guards and shields in place. | 8. Sliding and loss of control hazard—do not operate the machine near drop-offs or water; keep a safe distance from drop-offs. |

Product Overview



- Figure 2**
- | | |
|-------------------------|-----------------------------|
| 1. Side discharge chute | 7. Control levers |
| 2. Battery | 8. Manual tube |
| 3. Engine | 9. Platform (down position) |
| 4. Fuel shut-off valve | 10. Hydraulic tank |
| 5. Fuel tank | 11. Mower deck |
| 6. Controls | 12. Front caster wheel |

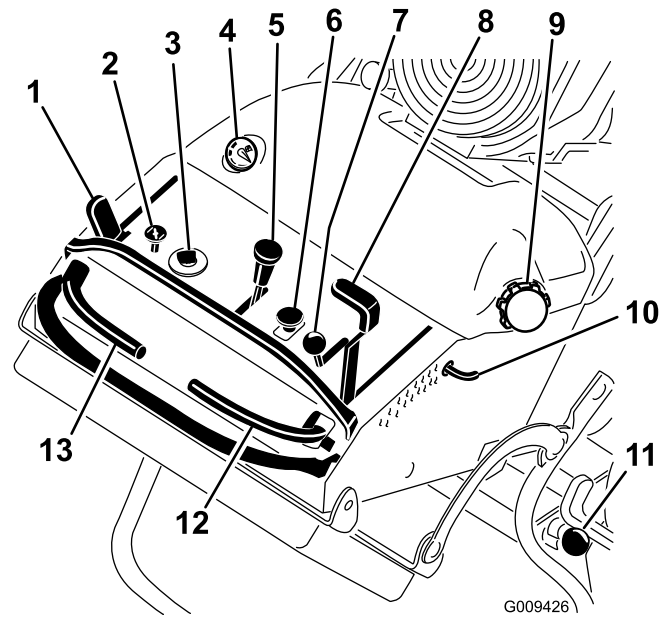


Figure 3

- | | |
|-------------------------------|--------------------------------|
| 1. Parking brake lever | 8. Height-of-cut lever |
| 2. Choke | 9. Fuel cap |
| 3. Ignition switch | 10. Height-of-cut pin |
| 4. Fuel gauge | 11. Platform latch |
| 5. Speed control lever | 12. Right motion control lever |
| 6. Blade control switch (PTO) | 13. Left motion control lever |
| 7. Throttle control | |

Controls

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

Hour Meter

The hour meter records the number of hours the engine has operated. It operates when the engine is running. Use these times for scheduling regular maintenance (Figure 4).

Fuel Gauge

The fuel gauge is located on the top left side of the tank (Figure 3).

Safety Interlock Indicators

There are symbols on the hour meter and indicate with a black triangle that the interlock component is in the correct position (Figure 4).

Battery Indicator Light

If the ignition key is turned to the **On** position for a few seconds, the battery voltage will be displayed in the area where the hours are normally displayed.

The battery light turns on when the ignition is turned on and when the charge is below the correct operating level (Figure 4).

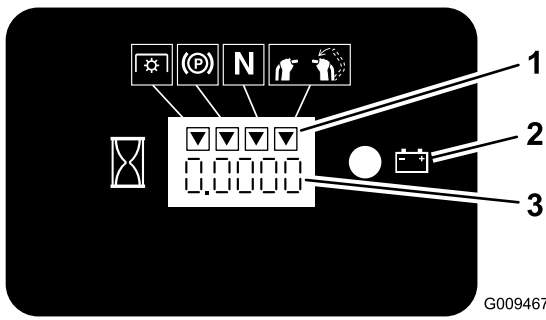


Figure 4

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

Speed Control Lever

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

Throttle Control

The throttle control is variable between **Fast** and **Slow**.

Choke

Use the choke to start a cold engine.

Blade Control Switch (PTO)

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

Ignition Switch

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

Motion Control Levers

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

Fuel Shut-off Valve

Close the fuel shut-off valve (on the right side of the engine) when transporting or storing the mower.

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.

48 inch mowers:

Width with deflector down	63.5 inches (161.3 cm)
Length with platform down	74 inches (188 cm)
Length with platform up	58 inches (147.3 cm)
Height	48 inches (121.9 cm)
Weight with 19hp engine	881 (399.6 kg)
Weight with 23hp engine	888 (402.8 kg)

52 inch mowers:

Width with deflector down	67.5 inches (171.4 cm)
Length with platform down	74 inches (188 cm)
Length with platform up	58 inches (147.3 cm)
Height	48 inches (121.9 cm)
Weight with 19hp engine	883 (400.5 kg)
Weight with 23hp engine	900 (408.2 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 inch (25 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

Note: Do not fill the fuel tank completely full. Add gasoline to the fuel tank until the level is 1 inch (25 mm) below the bottom of the filler neck. This empty space in the tank allows gasoline to expand.

1. Shut the engine off and set the parking brake.
2. Clean around the fuel tank cap.
3. Fill the fuel tank. Ensure there is space below the filler neck as shown in Figure 5.

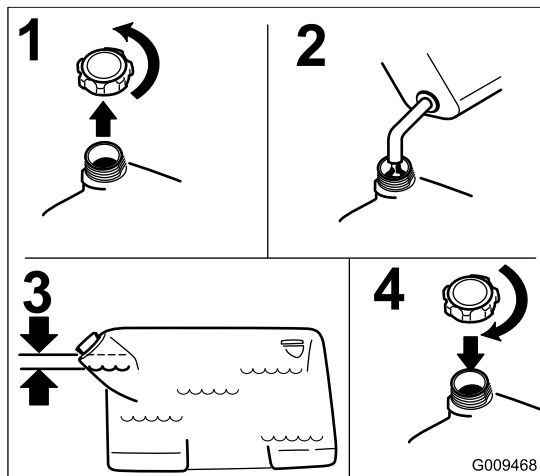
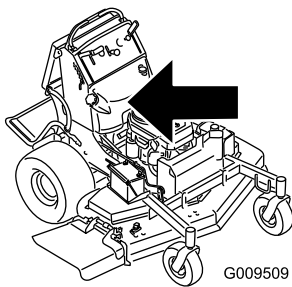


Figure 5

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.

Breaking In a New Machine

New engines take time to develop full power. Mower decks and drive systems have higher friction when new, placing additional load on the engine. Allow 40 to 50 hours of break-in time for new machines to develop full power and best performance.

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.

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 and over into engaged position (Figure 6).

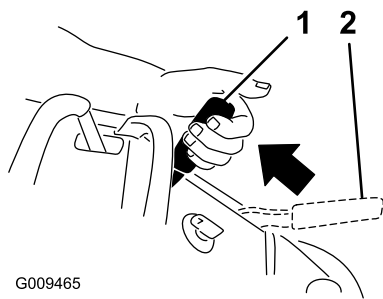


Figure 6

1. Parking brake engaged
2. Parking brake released

Releasing the Parking Brake

Pull the brake lever back and over into the slot and push the parking brake lever forward.

Operating the Mower Blade Control Switch (PTO)

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

Engaging the Mower Blades (PTO)

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

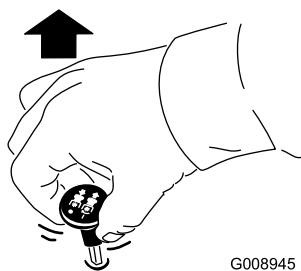


Figure 7

Disengaging the Mower Blades (PTO)

The following are two options for disengaging the mower blades.

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

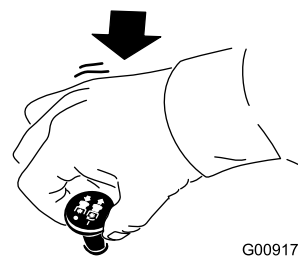


Figure 8

Operating the Throttle

The throttle control can be moved between **Fast** and **Slow** positions (Figure 9).

Always use the fast position when turning on the mower deck with the blade control switch (PTO).

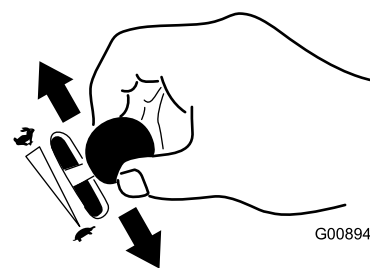


Figure 9

Operating the Choke

Use the choke to start a cold engine.

1. If the engine is cold, use the choke to start the engine.
2. Pull up on the choke knob to engage the choke before using the ignition switch (Figure 10).
3. Push down on the choke to disengage the choke after the engine has started (Figure 10).

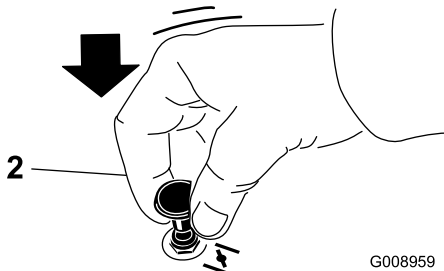
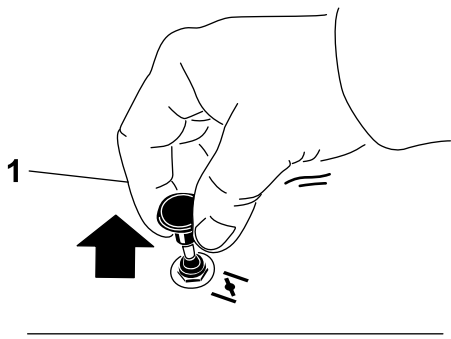


Figure 10

G008959

1. On

2. Off

Operating the Ignition Switch

1. Turn the ignition key to the Start position (Figure 11). When the engine starts, release the key.

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

Note: Additional starting cycles may be required when starting the engine for the first time after the fuel system has been without fuel completely.

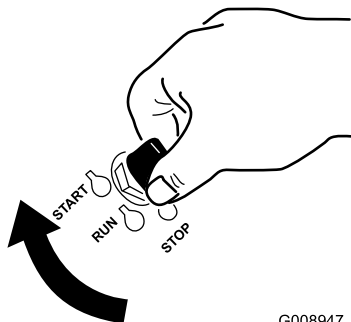


Figure 11

G008947

2. Turn the ignition key to stop to stop the engine.

Using the Speed Control Lever

This machine has a speed control lever that sets the speed of the machine. This can be adjusted to the operator's desired speed. It is recommended to use the slowest speed for new operator's.

1. Move the speed control lever to set the desired speed.
2. Move the control levers to drive the machine. The control levers may be pushed forward to the front reference bar while the speed of the machine is controlled by the speed control lever.

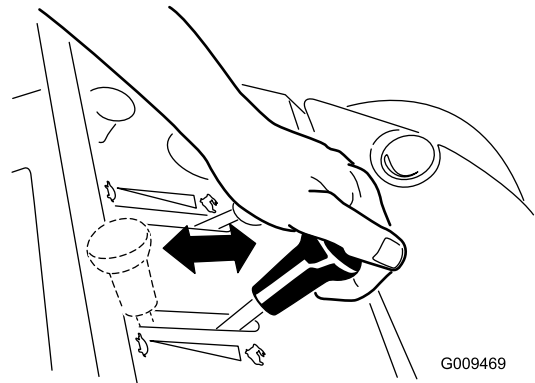


Figure 12

G009469

Using the Fuel Shut-Off Valve

Close the fuel shut-off valve for transport, maintenance, and storage (Figure 13).

Ensure the fuel shut-off valve is open when starting the engine.

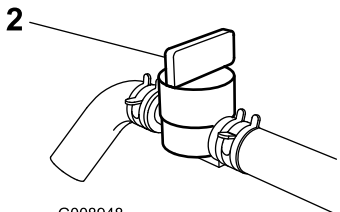
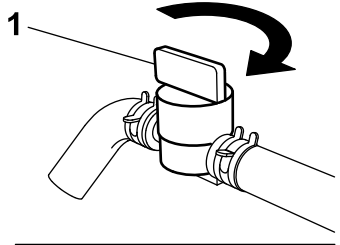
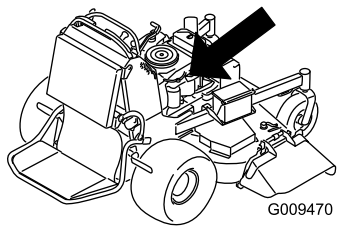


Figure 13

- 1. On
- 2. Off

Starting and Stopping the Engine

Starting the Engine

1. Connect the wires to the spark plugs.
2. Open the fuel valve.
3. Move the right motion control lever to neutral locked position.
4. Set the parking brake; refer to Setting the Parking Brake.
5. Move the blade control switch (PTO) to the **Off** position.
6. Move the throttle lever midway between the **Slow** and **Fast** positions.

Note: A warm or hot engine may not require choking.

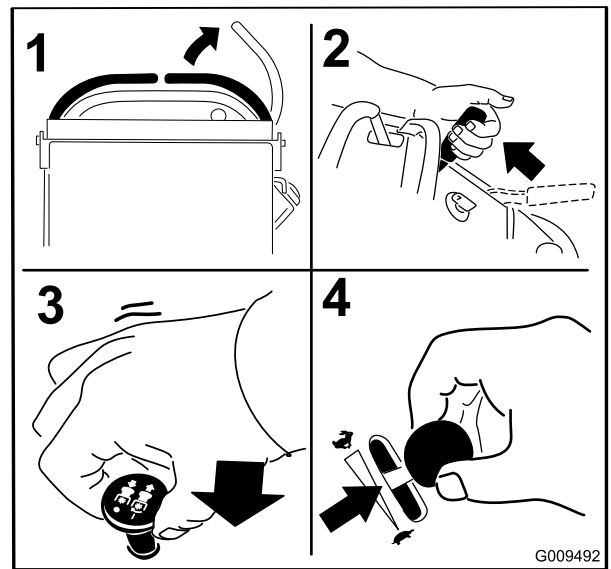


Figure 14

7. Turn the ignition key to the Start position (Figure 11). When the engine starts, release the key.

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

Note: Additional starting cycles may be required when starting the engine for the first time after the fuel system has been without fuel completely.

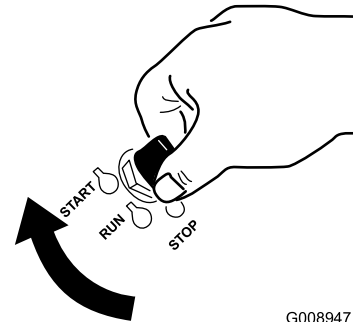


Figure 15

- 1. Off
- 2. Run
- 3. Start

Stopping the Engine



Children or bystanders may be injured if they move or attempt to operate the tractor 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.

Let the engine idle at slow throttle (turtle) for 60 seconds before turning the ignition switch off.

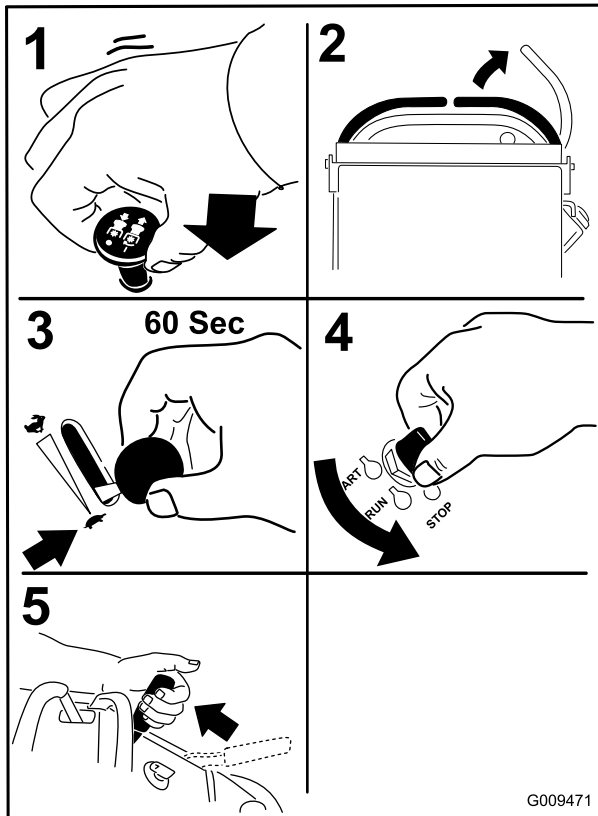


Figure 16

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

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 blades from rotating unless:

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

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

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

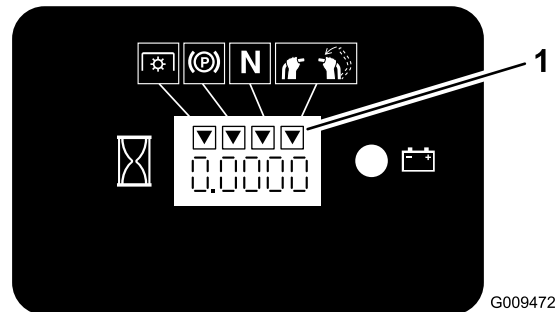


Figure 17

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

Testing the Safety Interlock System

Service Interval: Before each use or daily

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

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

1. Start the engine; refer to Starting and Stopping the Engine in Operation , page 13.
2. Set the parking brake.
3. Move the right side motion control lever to the center, un-locked position. **The blades should not rotate.**
4. Move the motion control levers forward. **The engine should kill.**
5. Start the engine and release the parking brake.
6. Move the right side motion control lever to the center, un-locked position.
7. Continue holding the right side motion control lever in the center, un-locked position and pull up on the blade control switch (PTO) and release. The clutch should engage and the mower blades begin rotating.
8. Move or release the right side motion control lever into the neutral lock position. **The blades should stop rotating and the engine continues to run.**
9. Push the blade control switch down and move the right side motion control lever to the center, un-locked position.
10. Continue holding the right side motion control lever in the center, un-locked position and pull up on the blade control switch (PTO) and release. The clutch should engage and the mower blades begin rotating.
11. Push the blade control switch (PTO) down to the off position. **The blades should stop rotating.**
12. With the engine running, pull up the blade control switch (PTO) and release without holding right side motion control lever to the center, un-locked position. **The blades should not rotate.**



The operator platform is heavy and may cause injury when lowering and raising the operator platform. The platform may suddenly drop if not supported when the latch pin is pulled out.

- **Do not put your hands or fingers in the platform pivot area when lowering or raising the operator platform.**
- **Make sure the platform is supported when the latch pin is pulled out.**
- **Make sure the latch secures the platform when folding it in the up position. Push it tight against the cushion for the latch pin to lock into place.**

Operating the Platform

The machine can be used with the platform in the up or down position. It is the operator's preference on which position to use.

Operating the Machine with the Platform Up

Operating the machine with the platform up is recommended when:

- Mowing near drop-off's
- Mowing small areas where the machine is too long
- Areas with low over hanging branches or obstacles
- Loading the machine for transport
- Driving up slopes

To raise the platform, pull the back of the platform up so the latch pin and knob lock it into place. Push it tight against the cushion for the latch pin to lock into place.

Operating the Machine with the Platform Down

Operating the machine with the platform down is recommended when:

- Mowing most areas
- Driving down slopes

To lower the platform, push the platform forward against the cushion to release pressure on the latch pin and then pull the knob out and lower the platform.

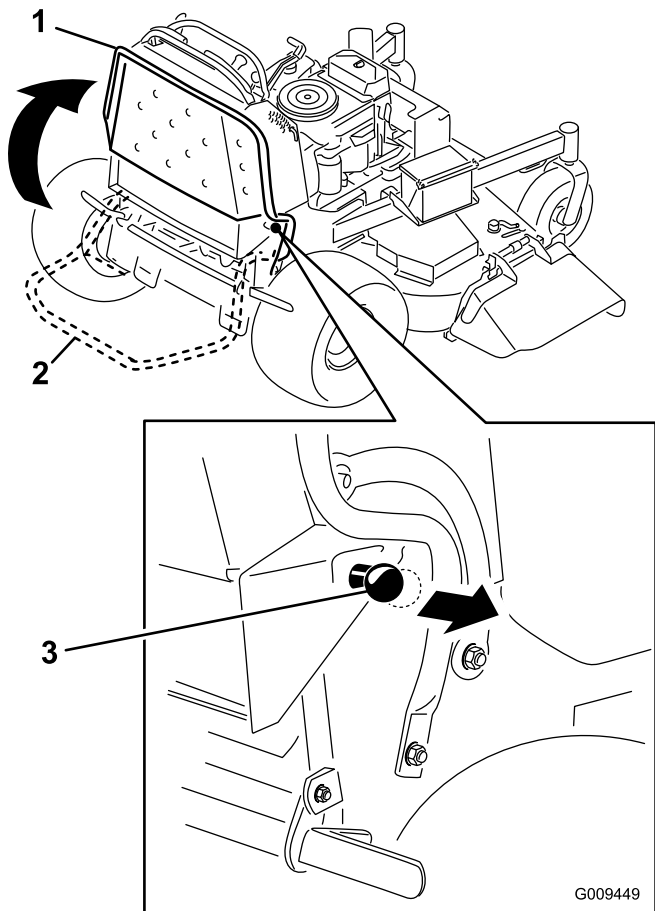


Figure 18

1. Platform up
2. Platform down
3. Pull the knob out to lower the platform

Driving Forward or Backward

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



Machine can spin very rapidly. Operator may lose control of machine and cause personal injury or damage to machine.

Slow the machine down before making sharp turns.

Driving Forward

1. Release the parking brake; refer to Releasing the Parking Brake in Operation.

2. Move the right side motion control lever to the center, un-locked position.

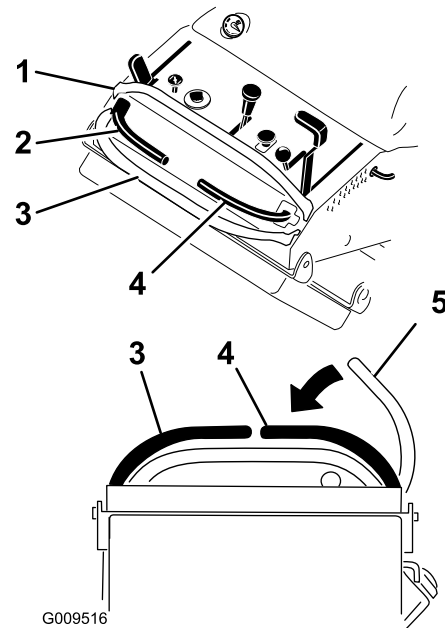


Figure 19

1. Front reference bar
2. Left control lever
3. Rear reference bar
4. Right control lever
5. Right control lever in the neutral lock position

3. To go forward, move the speed control lever to the desired speed.
4. Slowly push the motion control levers forward (Figure 20).

Note: The engine will kill if the right hand control lever is moved with the parking brake engaged.

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

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

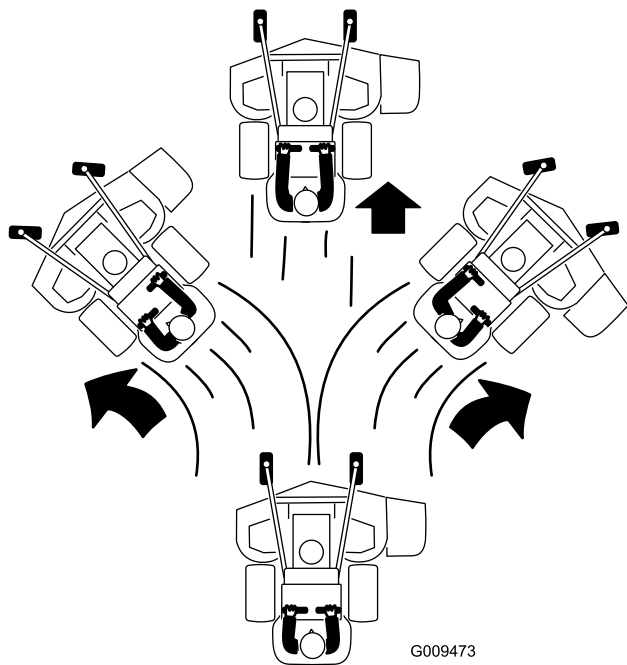


Figure 20

Driving Backward

1. Move the right side motion control lever to the center, un-locked position.
2. Slowly pull the motion control levers rearward (Figure 21).

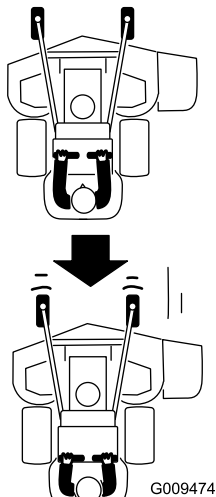


Figure 21

Stopping the Machine

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

Set the parking brake when you leave the machine; refer to Setting the Parking Brake in Operation , page 13. Remember to remove the key from the ignition switch.



Children or bystanders may be injured if they move or attempt to operate the tractor 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 22).

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.

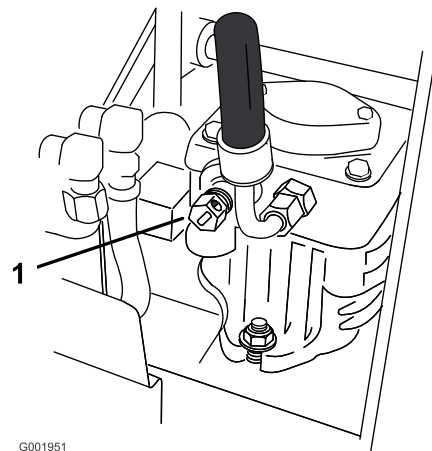


Figure 22

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. Raise the platform of the machine before driving up onto the trailer or truck.
2. If using a trailer, connect it to the towing vehicle and connect the safety chains.
3. If applicable, connect the trailer brakes.
4. Load the machine onto the trailer or truck.
5. Stop the engine, remove the key, set the brake, and close the fuel valve.
6. 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 23).

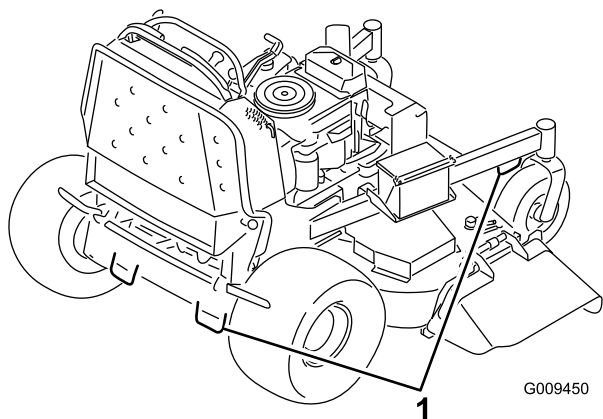


Figure 23

1. Traction unit tie down loop

Loading Machines

Use extreme caution when loading units on trailers or trucks. One full width ramp that is wide enough to

extend beyond the rear tires is recommended instead of individual ramps for each side of the unit (Figure 24). The lower rear section of the tractor frame extends back between the rear wheels and serves as a stop for tipping backward. Having a full width ramp provides a surface for the frame members to contact if the unit starts to tip backward. If it is not possible to use one full width ramp, use enough individual ramps to simulate a full width continuous ramp.

The ramp should be long enough so that the angles do not exceed 20 degrees (Figure 24). A steeper angle may cause mower components to get caught as the unit moves from ramp to trailer or truck. Steeper angles may also cause the unit to tip backward. If loading on or near a slope, position the trailer or truck so it is on the down side of the slope and the ramp extends up the slope. This will minimize the ramp angle. The trailer or truck should be as level as possible.

Important: Do Not attempt to turn the unit while on the ramp; you may lose control and drive off the side.

Avoid sudden acceleration when driving up a ramp and sudden deceleration when backing down a ramp. Both maneuvers can cause the unit to tip backward.



Loading a unit onto a trailer or truck increases the possibility of backward tip-over and could cause serious injury or death.

- Use extreme caution when operating a unit on a ramp.
- Use only a single, full width ramp; Do Not use individual ramps for each side of the unit.
- If individual ramps must be used, use enough ramps to create an unbroken ramp surface wider than the unit.
- Do not exceed a 20 degree angle between ramp and ground or between ramp and trailer or truck.
- Avoid sudden acceleration while driving unit up a ramp to avoid tipping backward.
- Avoid sudden deceleration while backing unit down a ramp to avoid tipping backward.

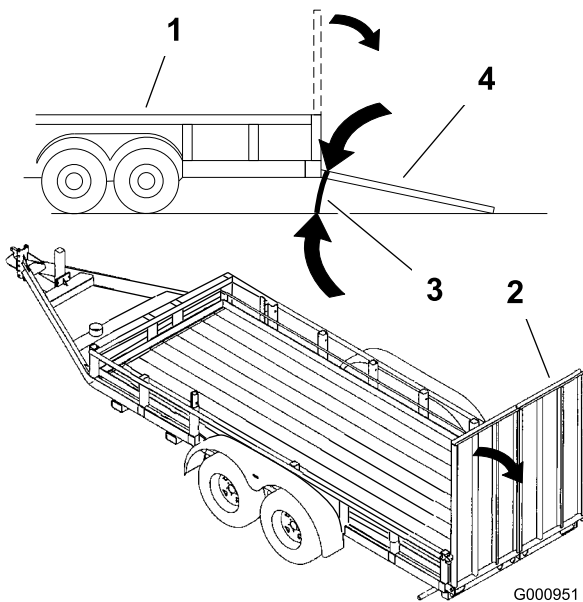


Figure 24

- | | |
|--------------------|--------------------------------|
| 1. Trailer | 3. Not greater than 20 degrees |
| 2. Full width ramp | 4. Full width ramp—side view |

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.

1. Move the height-of-cut lever to the transport position (all the way up).
2. Select a hole in the height-of-cut bracket corresponding to the height-of-cut desired and, insert the pin (Figure 25).
3. Lower the height-of-cut lever to the pin (Figure 25).

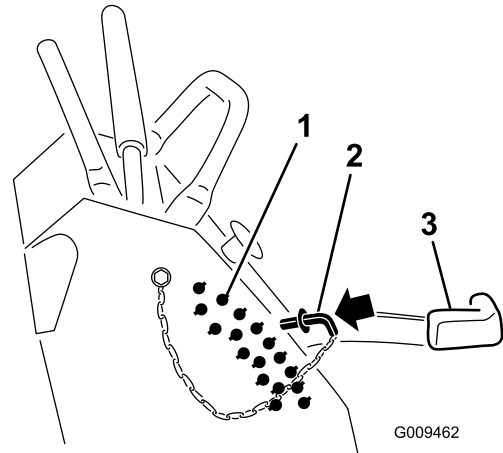


Figure 25

- | | |
|------------------------|------------------------|
| 1. Height-of-cut holes | 3. Height-of-cut lever |
| 2. Height-of-cut pin | |

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 26).
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 26).
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.

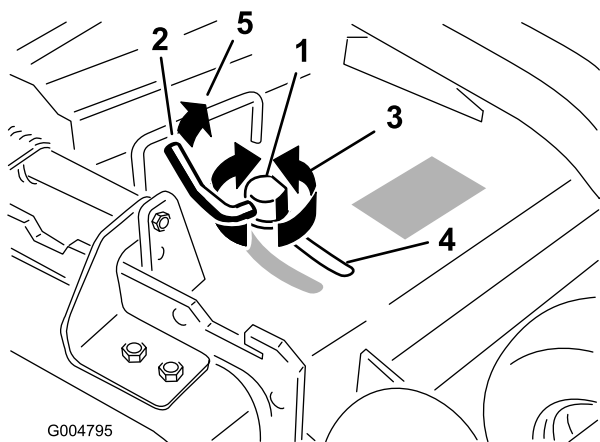


Figure 26

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

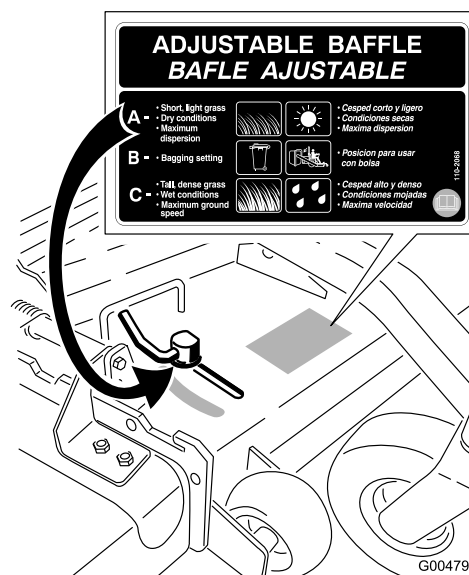


Figure 27

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 27). The suggested use for this position is as follows.

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

Position B

Use this position when bagging (Figure 28).

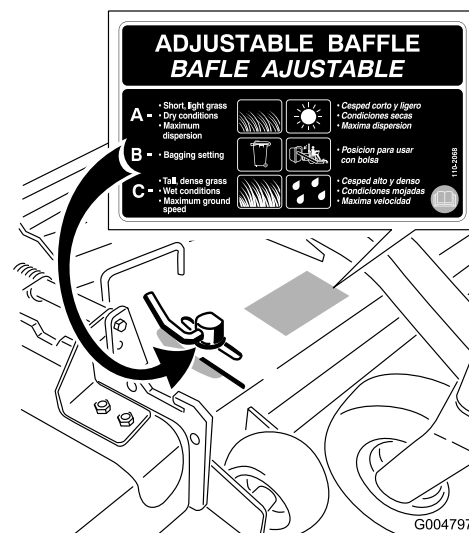


Figure 28

Position C

This is the full open position. The suggested use for this position is as follows (Figure 29).

- 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.

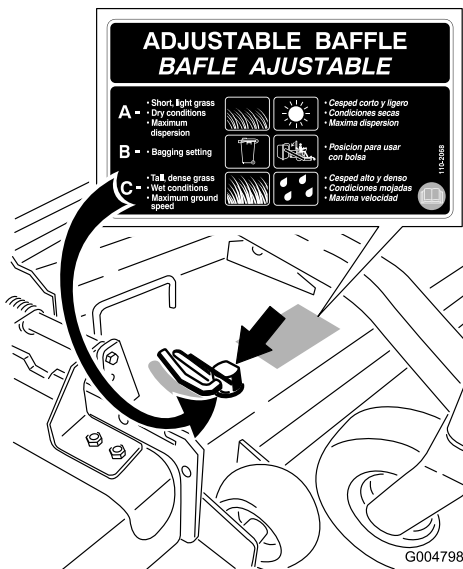


Figure 29

Using the Mid-Size Weight

- Weights are installed to improve handling, balance and improve performance. Weights can be added or removed to create optimized performance under different mowing conditions and for operator preference.
- It is recommended that weights be added or removed one at a time until the desired handling and balance is achieved.

Note: Contact an Authorized Service Dealer to order a Weight Kit.



Excessive weight changes can effect handling and operation of the machine. This could cause serious injury to you or bystanders.

Make weight changes is small increments only.

Evaluate the mower after each weight change to ensure the machine can be operated safely.

Maintenance

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

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first 8 hours	<ul style="list-style-type: none"> • Change the engine oil. • Check the hydraulic fluid level. • Change the hydraulic filter.
Before each use or daily	<ul style="list-style-type: none"> • Check the safety interlock system. • Check the engine oil level. • Clean the air intake screen. • Check the brakes. • Inspect the blades. • Clean the mower deck.
Every 25 hours	<ul style="list-style-type: none"> • Clean foam air cleaner element.
Every 50 hours	<ul style="list-style-type: none"> • Check the paper air cleaner element. • Check the tire pressure. • Check the hydraulic fluid level.
Every 100 hours	<ul style="list-style-type: none"> • Change the engine oil. (more often in dirty or dusty conditions) • Check, clean and regap the spark plug. • Check the electric clutch. • Check and clean engine cooling fins and shrouds. • Check the mower deck belt. • Check the pump drive belt. • Check the hydraulic lines.
Every 200 hours	<ul style="list-style-type: none"> • Grease the mower deck spindles (more often in dirty or dusty conditions). • Grease the lift linkage (more often in dirty or dusty conditions). • Replace the paper air cleaner element. • Change the engine oil filter.
Every 400 hours	<ul style="list-style-type: none"> • Replace the fuel filter. • Check the battery electrolyte level. • Change the hydraulic filter.
Every 500 hours	<ul style="list-style-type: none"> • Adjust the caster pivot bearing.
Every 800 hours	<ul style="list-style-type: none"> • Grease the front wheel bearings (more often in dirty or dusty conditions). • Grease the front caster pivots (more often in dirty or dusty conditions). • Lubricate the traction rollers (more often in dirty or dusty conditions).
Before storage	<ul style="list-style-type: none"> • Paint chipped surfaces. • Perform all maintenance procedures listed above before storage.

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



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

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

Premaintenance Procedures

Raising the Mower for Access

The front of the mower can be raised and supported on its back for access under the machine for maintenance.

1. Raise the platform. Refer to Operating the Platform in Operation.
2. Remove the battery.

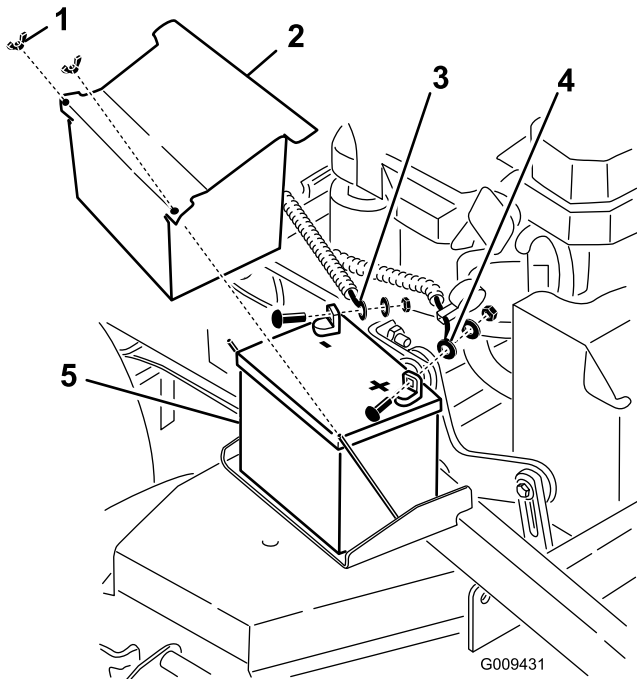


Figure 30

1. Wing nut
2. Battery cover
3. Negative battery cable
4. Positive battery cable
5. Battery

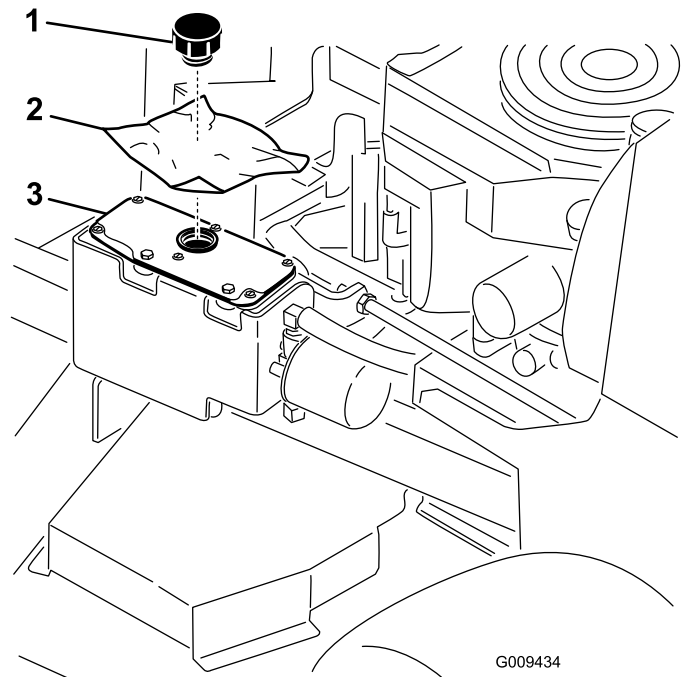


Figure 31

1. Cap
2. Piece of plastic
3. Hydraulic tank

3. Drain the fuel from the fuel tank. Refer to Draining the Fuel Tank in Maintenance.
4. Remove the cap of the hydraulic tank and place a piece of plastic over the opening and install the hydraulic cap. This will seal the hydraulic tank and prevent it from leaking out.

5. With two people, raise the front of the mower so it rests on the drive tires and the platform in the up position.
6. Perform any maintenance on the machine.
7. With two people, lower the front of the mower to the ground.
8. Remove the plastic under the hydraulic tank cap.
9. Install the battery for the machine.

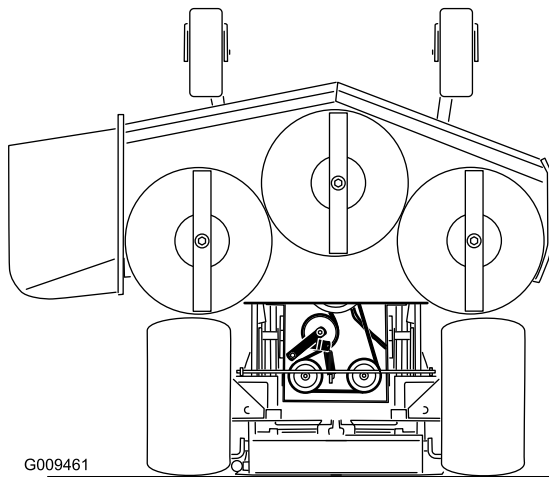
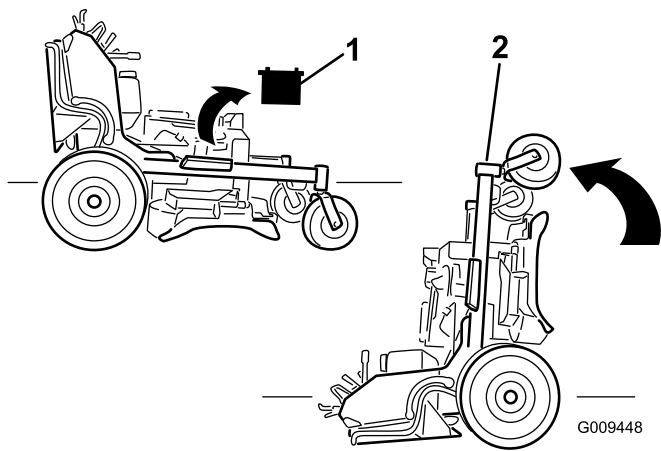


Figure 32

1. Remove battery
2. With two people, lift the front end of the mower (ensure the platform is up)

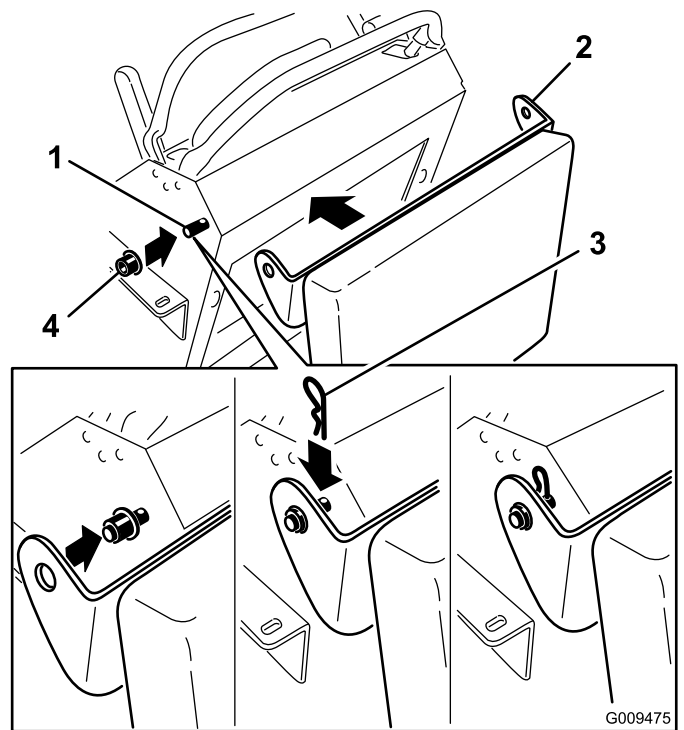


Figure 33

1. Pin
2. Cushion bracket
3. Hairpin cotter pin
4. Plastic bushing

Remove the Cushion for Rear Access

The cushion can be removed for rear access to the machine for maintenance or adjustment.

1. Lower the platform.
2. Remove the hairpin cotter pins on each side of the cushion.
3. Slide the cushion to the side to remove it from the pins and plastic bushings on both sides.
4. Lower the cushion to the platform.
5. Perform any maintenance or adjustment on the machine.
6. Install the plastic bushings onto the pins (Figure 33).
7. Raise the cushion and slide it onto the pins on both sides of the machine.
8. Slide the plastic bushings into the cushion bracket and secure them with a hairpin cotter pin (Figure 33).

Lubrication

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

Lubricate the traction rollers with a dry lubricant (PTFE).

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 Machine

Service Interval: Every 200 hours—Grease the mower deck spindles (more often in dirty or dusty conditions).

Every 200 hours—Grease the lift linkage (more often in dirty or dusty conditions).

Every 800 hours/Yearly (whichever comes first)—Grease the front wheel bearings (more often in dirty or dusty conditions).

Every 800 hours/Yearly (whichever comes first)—Grease the front caster pivots (more often in dirty or dusty conditions).

Every 800 hours/Yearly (whichever comes first)—Lubricate the traction rollers (more often in dirty or dusty conditions).

Use the following graphics for locating the grease points.

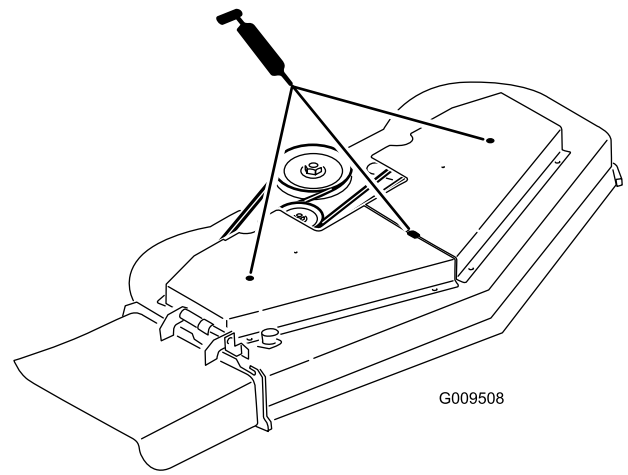


Figure 34

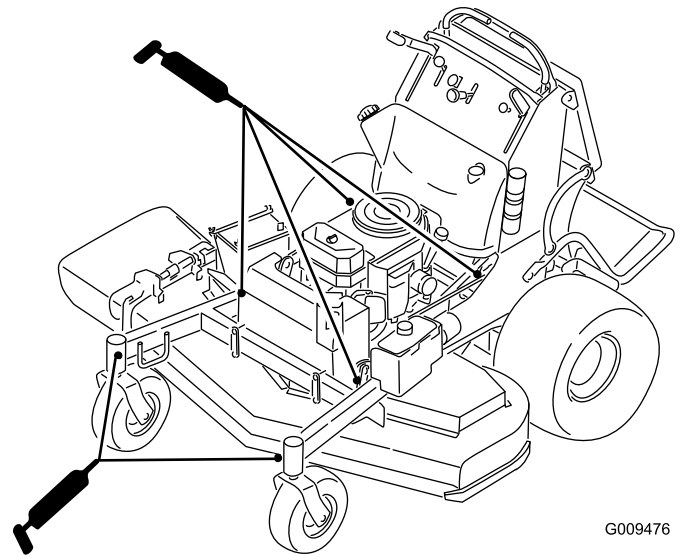


Figure 35

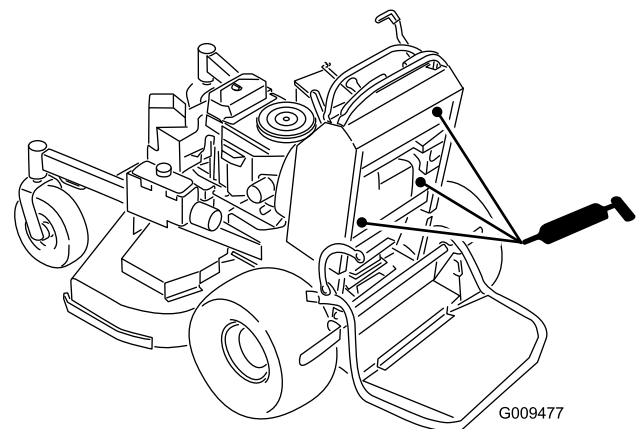


Figure 36

Lubricate the traction rollers with a dry lubricant.

Engine Maintenance

Servicing the Air Cleaner

Service Interval/Specification

Inspect the foam and paper elements and replace them if they are damaged or excessively dirty.

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

Important: Do not oil the foam or paper element.

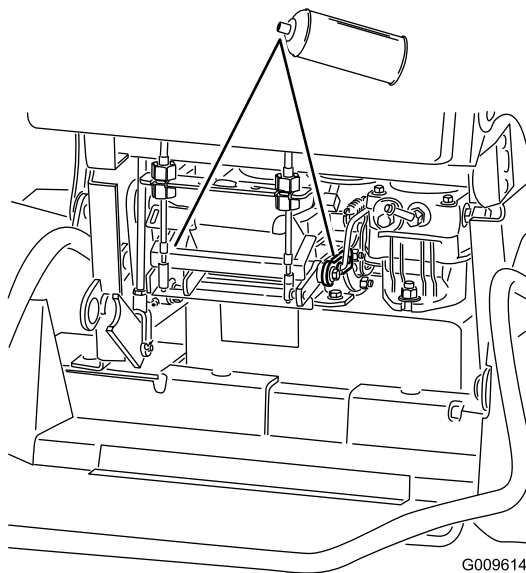


Figure 37

Removing the Foam and Paper Elements

1. Disengage the PTO and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Clean around the air cleaner to prevent dirt from getting into the engine and causing damage (Figure 38).
4. Unscrew the cover knob and remove the air cleaner cover (Figure 38).
5. Remove the wing nuts and remove the air cleaner assembly (Figure 38).
6. Carefully pull the foam element off the paper element (Figure 38).

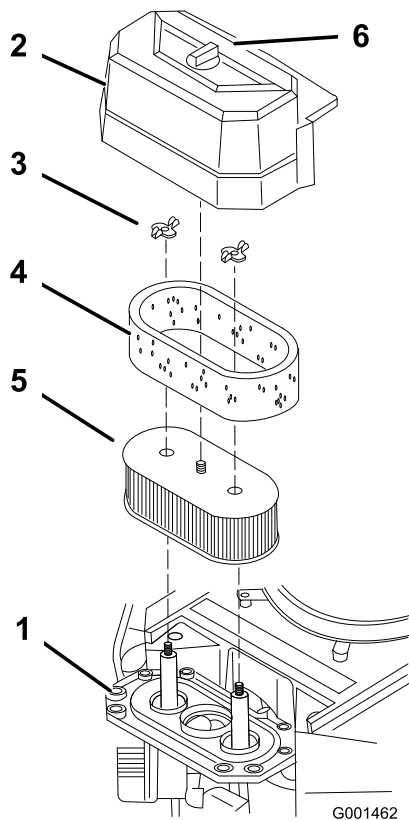


Figure 38
19hp Engine Shown

- | | |
|-------------|------------------|
| 1. Engine | 4. Foam element |
| 2. Cover | 5. Paper element |
| 3. Wing nut | 6. Cover knob |

Cleaning the Foam Air Cleaner Element

Service Interval: Every 25 hours

1. Wash the foam element in liquid soap and warm water. When the element is clean, rinse it thoroughly.
2. Dry the element by squeezing it in a clean cloth.

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

Servicing the Paper Air Cleaner Element

Service Interval: Every 50 hours—Check the paper air cleaner element.

Every 200 hours—Replace the paper air cleaner element.

1. Do not clean the paper filter, replace it (Figure 38).
2. Inspect the element for tears, an oily film, or damage to the rubber seal.
3. Replace the paper element if it is damaged.

Installing the Foam and Paper Elements

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

1. Carefully slide the foam element onto the paper air cleaner element (Figure 38).
2. Place the air cleaner assembly onto the air cleaner base and secure it with the 2 wing nuts (Figure 38).
3. Place the air cleaner cover into position and tighten the cover knob (Figure 38).

Servicing the Engine Oil

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

After the first 8 hours—Change the engine oil.

Every 100 hours—Change the engine oil. (more often in dirty or dusty conditions)

Every 200 hours—Change the engine oil filter.

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

Oil Type: Detergent oil (API service SF, SG, SH, 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 below

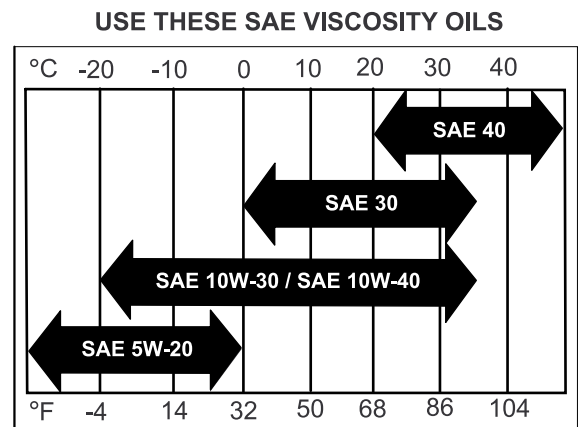


Figure 39

Checking the Engine Oil Level

Note: Check the oil when the engine is cold.



Contact with hot surfaces may cause personal injury.

Keep hands, feet, face, clothing and other body parts away the muffler and other hot surfaces.

Important: Do not overfill the crankcase with oil because damage to the engine may result. Do not run engine with oil below the low mark because the engine may be damaged.

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 (Figure 40).

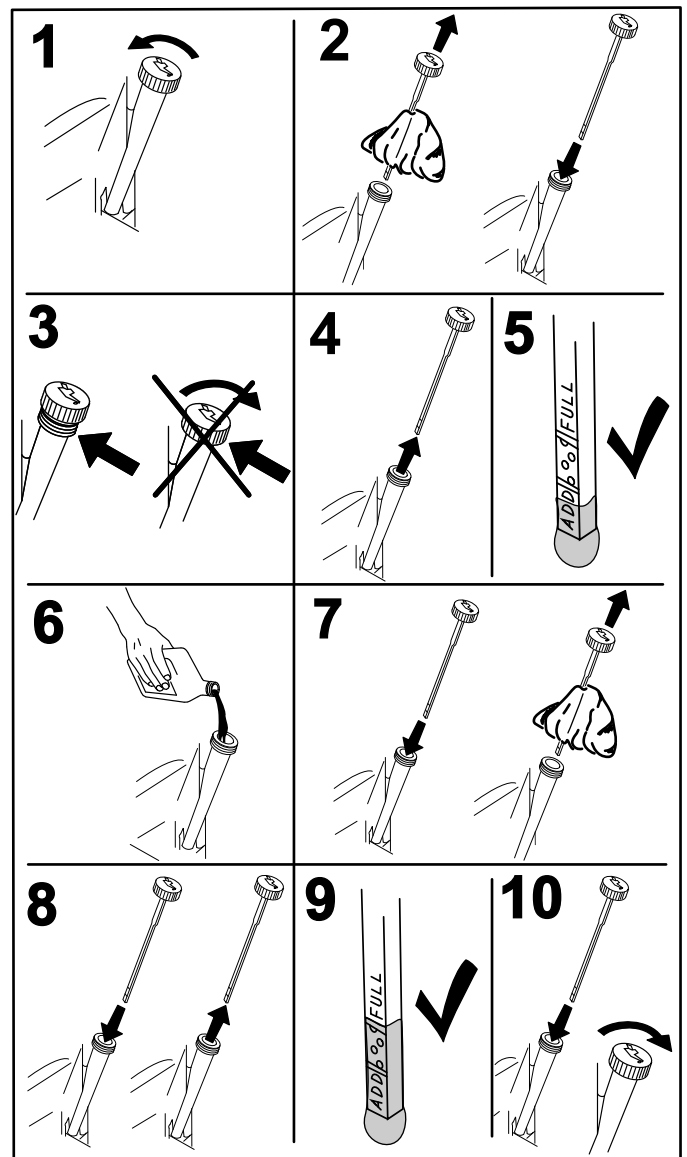
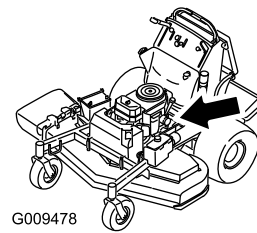


Figure 40

Changing the Engine Oil

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

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.

- Disengage the PTO, move the motion control levers to the neutral locked position and set the parking brake.
- Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position (Figure 41).

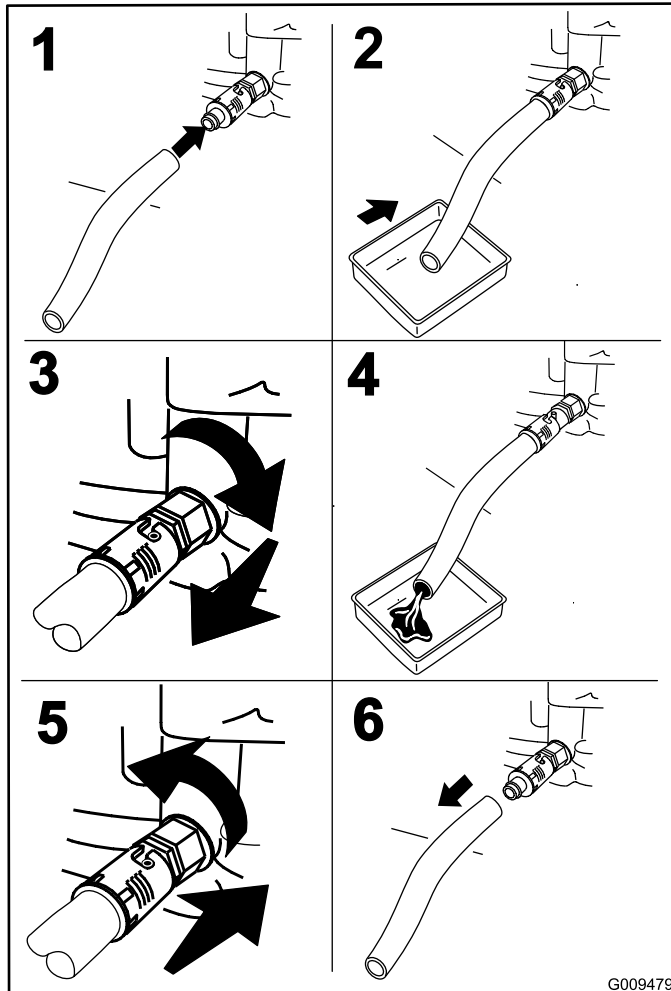
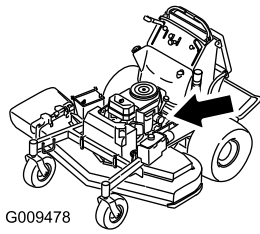


Figure 41

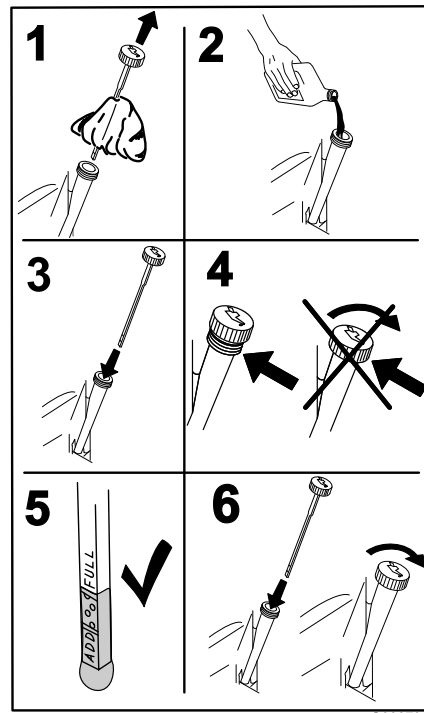


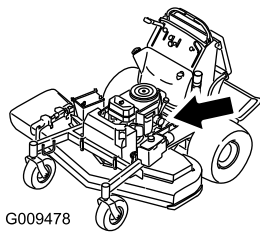
Figure 42

Changing the Engine Oil Filter

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

- Drain the oil from the engine; refer to Changing the Engine Oil.
- Change the engine oil filter (Figure 43).

- Slowly pour approximately 80% of the specified oil into the filler tube and slowly add the additional oil to bring it to the **Full** mark (Figure 42).



Type for 19hp Engines: Champion® RCJ8Y or equivalent

Type for 23hp Engines: NGK® BPR4ES or equivalent

Air Gap: 0.030 inch (0.75 mm)

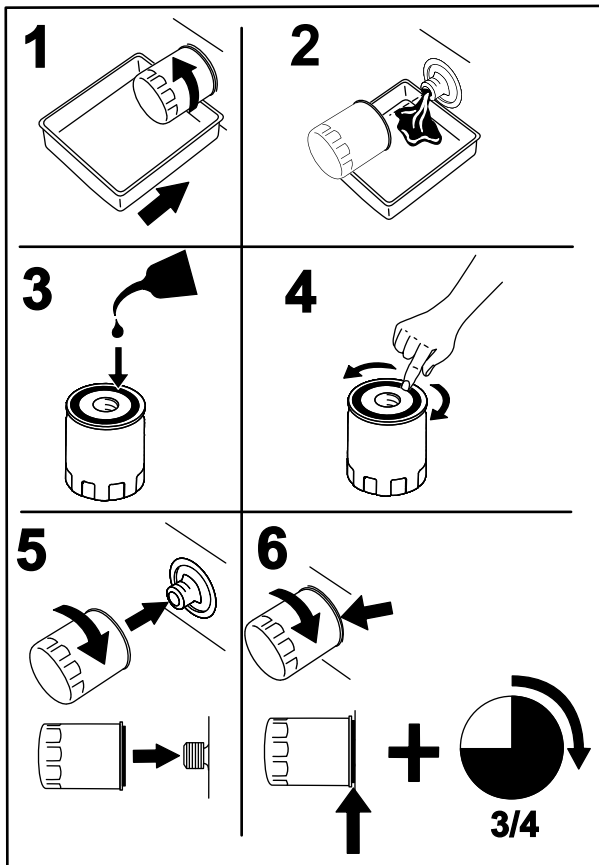


Figure 43

Note: Ensure the oil filter gasket touches the engine and then an extra 3/4 turn is completed.

- Fill the crankcase with the proper type of new oil; refer to Changing the Oil.

Servicing the Spark Plug

Service Interval: Every 100 hours

Make sure 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 plug(s) and a gapping tool/feeler gauge to check and adjust the air gap. Install a new spark plug(s) if necessary.

Note: There are different spark plugs for the 19hp and 23hp engines. Ensure the correct spark plug is used.

Removing the Spark Plug

- Disengage the PTO, move the motion control levers to the neutral locked position and set the parking brake.
- Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.

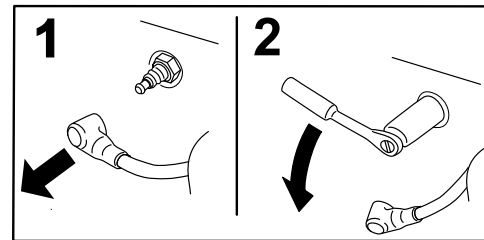
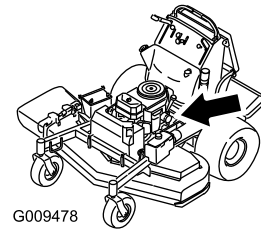


Figure 44

Checking the Spark Plug

Important: Never clean the spark plug(s). Always replace the spark plug(s) when it has: a black coating, worn electrodes, an oily film, or cracks.

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

Set the gap to 0.030 inches (0.76 mm).

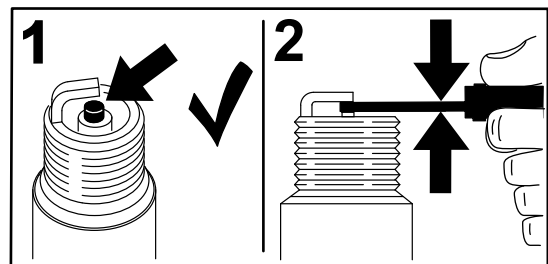


Figure 45

Installing the Spark Plug

Tighten the spark plug(s) to 16 ft.-lb (22 N-m).

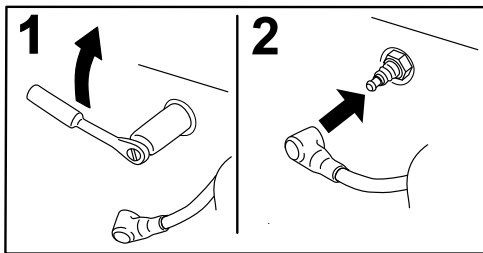


Figure 46

G008795

Fuel System Maintenance

Draining the Fuel Tank

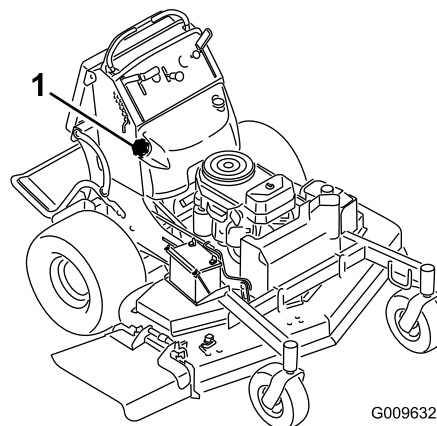
Note: There is no other recommended way to drain fuel from the tank, other than using a syphon pump. A syphon pump can be purchased at a hardware store.



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. Disengage the power take off (PTO), set the parking brake, turn the ignition key to **Off** and remove the key.
2. Clean around the fuel cap to prevent debris from getting into the fuel tank (Figure 48).
3. Remove the fuel cap.
4. Insert a syphon pump into the fuel tank.
5. Using the syphon pump, drain the fuel into a clean gas can (Figure 47).
6. Wipe up any spilled fuel.



G009632

Figure 47

1. Fuel cap

Servicing the Fuel Filter

Replacing the Fuel Filter

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

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.
4. Squeeze the ends of the hose clamps together and slide them away from the filter (Figure 48).

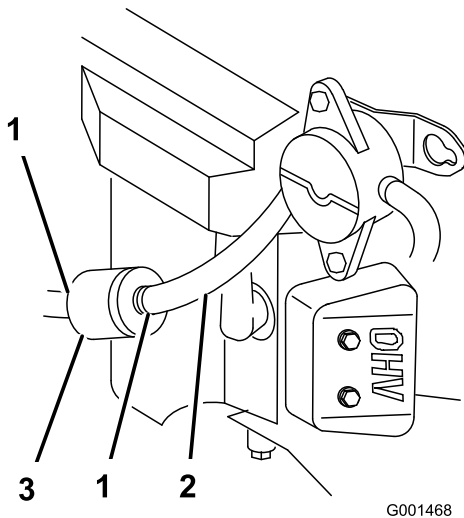


Figure 48

1. Hose clamp
2. Fuel line
3. Filter

5. Remove the filter from the fuel lines.
6. Install a new filter and move the hose clamps close to the filter.
7. Open the fuel shut-off valve.
8. Check for fuel leaks and repair if needed.
9. Wipe up any spilled fuel.

Electrical System Maintenance

Servicing the Battery

Always keep the battery clean and fully charged. Use a paper towel to clean the battery case. If the battery terminals are corroded, clean them with a solution of 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.

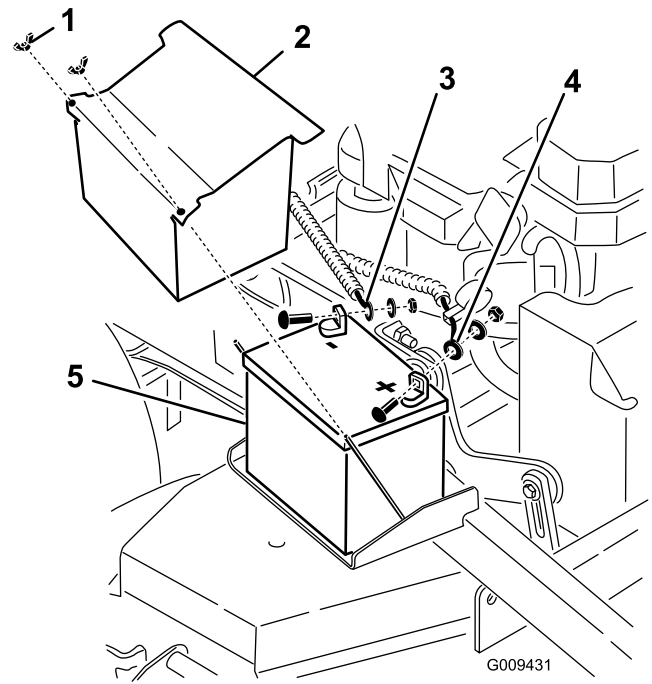


Figure 49

- | | |
|---------------------------|---------------------------|
| 1. Wing nut | 4. Positive battery cable |
| 2. Battery cover | 5. Battery |
| 3. Negative battery 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 49).
4. Slide the red terminal boot off the positive (red) battery terminal. Then remove the positive (red) battery cable (Figure 49).
5. Remove the battery hold down plate (Figure 49) and remove the battery.

Installing the Battery

1. Place the battery onto the machine (Figure 49).
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 49). 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 49). Slide the rubber cover over the post.

Checking the Battery Electrolyte Level

Service Interval: Every 400 hours



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 50). Do not allow the electrolyte to fall below the Lower line (Figure 50).

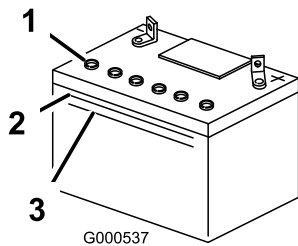


Figure 50

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 Maintenance.

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 Maintenance.

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 50).
4. Slowly pour distilled water into each battery cell until the electrolyte level is up to the Upper line (Figure 50) 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 50) 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 51).
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.

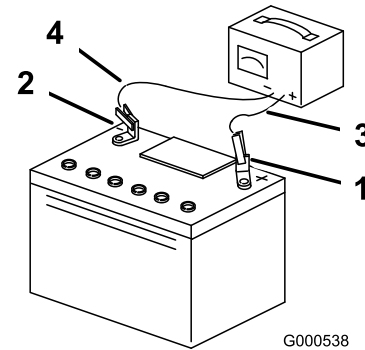


Figure 51

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

Servicing the Fuses

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

1. Remove the cushion from the rear of the machine.
2. Pull out on the fuse to remove or replace it (Figure 52).
3. Install the cover under the cushion.

Note: Ensure the correct size fuse is install with the correct wire color as shown in Figure 52.

Drive System Maintenance

Adjusting the Tracking

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

1. Push both control levers forward the same distance.
2. Check if the machine pulls to one side. If it does, stop the machine and set the parking brake.
3. Remove the cushion from the rear of the machine.
4. Rotate the thumb adjustment on the side of the machine that it tracks to (as viewed from the rear of the machine)(Figure 53).
5. Adjust in quarter-turn increments until the machine tracks straight.
6. Check for proper tracking.

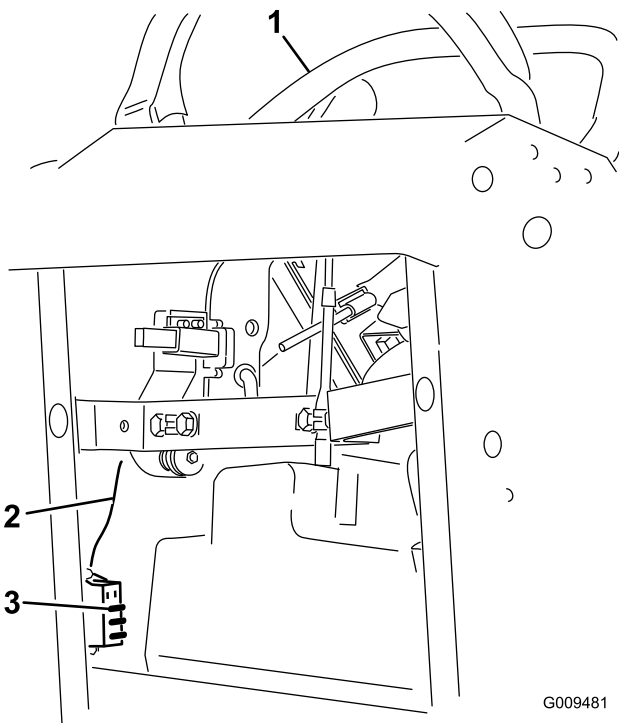


Figure 52

1. Controls
2. Wire
3. Fuses

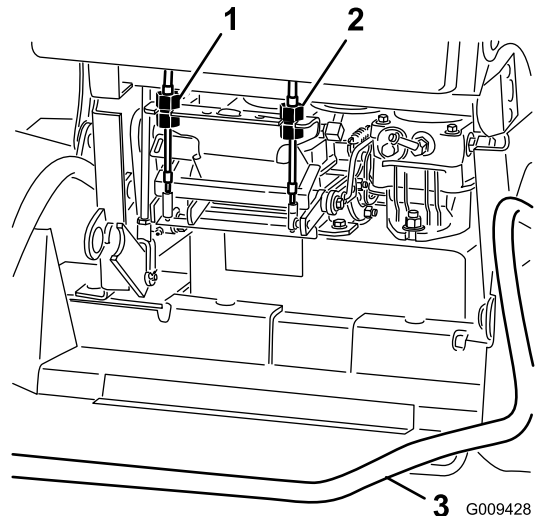


Figure 53

1. Left thumb adjustment
2. Right thumb adjustment
3. Platform down

7. Repeat adjustment until the tracking is correct.
8. Check that the machine does not creep from neutral with the park brakes disengaged.

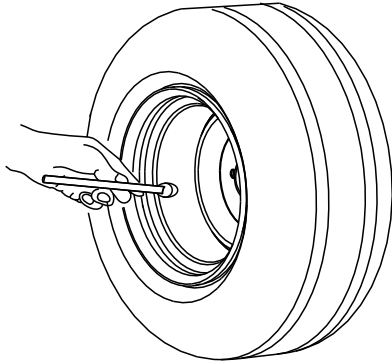
Important: Do Not rotate the linkage too far, as this may cause the machine to creep in neutral.

Checking the Tire Pressure

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

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

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



G001055

Figure 54

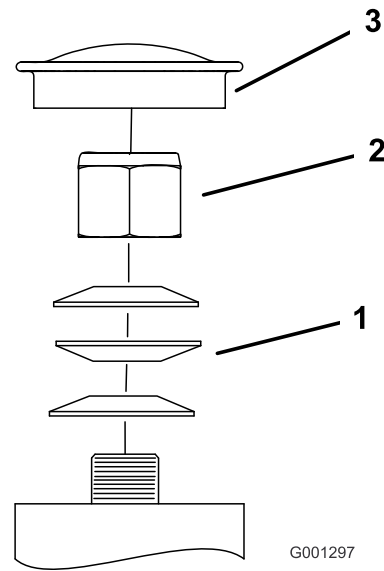
Adjusting the Caster Pivot Bearing

Service Interval: Every 500 hours/Yearly (whichever comes first)

1. Disengage the blade control switch (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. Remove the dust cap from caster and tighten lock nut (Figure 55).
4. Tighten the locknut until the spring washers are flat and then back off a 1/4 turn to properly set the pre-load on the bearings (Figure 55).

Important: Make sure spring washers are installed correctly as shown in Figure 55.

5. Install the dust cap (Figure 55).



G001297

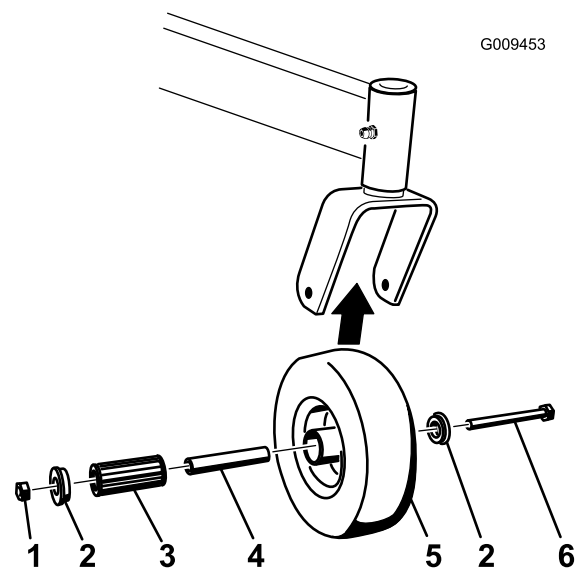
Figure 55

1. Spring Washers
2. Lock Nut
3. Dust Cap

Servicing the Caster Wheel and Bearings

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

1. Remove the locknut and wheel bolt holding the caster wheel to the caster fork (Figure 56).



G009453

Figure 56

1. Locknut
2. Wheel Bolt
3. Bushing
4. Spanner Bushing
5. Roller Bearing
6. Caster Fork

2. Remove one bushing, then pull the spanner bushing and roller bearing out of the wheel hub (Figure 56).
3. Remove the other bushing from the wheel hub and clean any grease and dirt from the wheel hub (Figure 56).
4. Inspect the roller bearing, bushings, spanner bushing and inside of the wheel hub for wear. Replace any defective or worn parts (Figure 56).
5. To assemble, place one bushing into the wheel hub. Grease the roller bearing and spanner bushing and slide them into the wheel hub. Place the second bushing into the wheel hub (Figure 56).
6. Install the caster wheel into the caster fork and secure with the wheel bolt and locknut. Tighten the locknut until the spanner bushing bottoms against the inside of the caster forks (Figure 56).
7. Grease the fitting on the caster wheel.

Adjusting the Electric Clutch

Service Interval: Every 100 hours—Check the electric clutch.

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

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 57).
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.

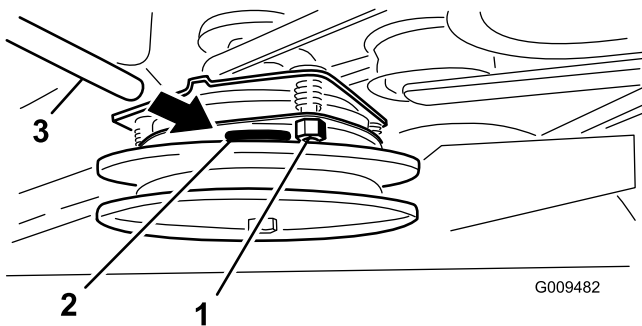


Figure 57

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

Cooling System Maintenance

Cleaning the Air Intake Screen

Service Interval: Before each use or daily

Before each use remove any 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.

Cleaning the Cooling System

Service Interval: Every 100 hours—Check and clean engine cooling fins and shrouds.

1. Disengage the PTO and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Remove the air intake screen and fan housing (Figure 58).
4. Clean the debris and grass from the engine parts.
5. Install air intake screen, recoil starter and fan housing (Figure 58).

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

Service Interval: Before each use or daily

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.

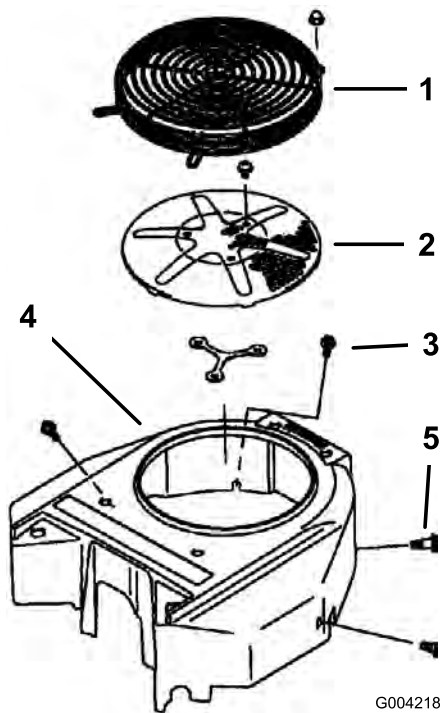


Figure 58

- | | |
|-----------------------------|----------------|
| 1. Guard | 4. Fan housing |
| 2. Engine air intake screen | 5. Screw |
| 3. Bolt | |

Adjusting the Brakes

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

1. Check the brake before you adjust it; refer to Checking the Brakes.
2. Park the machine on a level surface, 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. Release the parking brake; refer to Releasing the Parking Brake Operation.
5. To adjust the brake, remove the hair pin cotter and clevis pin from the lower brake lever and yoke (Figure 59).
6. Loosen the jam nut (Figure 59).
7. Rotate the yoke. To tighten the brake, rotate the yoke up. To loosen the brake, rotate the yoke down (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 pin and clevis pin (Figure 59).
9. Tighten the jam nut (Figure 59).
10. Check the brake operation again; refer to Checking the Brake.

Belt Maintenance

Replacing the Mower Deck Belt

Service Interval: Every 100 hours—Check the mower deck 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.

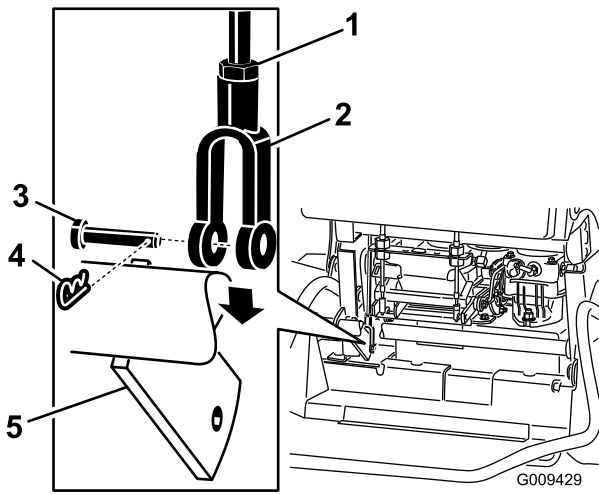


Figure 59

1. Jam Nut
2. Yoke
3. Clevis pin
4. Hairpin cotter pin
5. Lower brake lever

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 belt covers.
4. Loosen the front idler pulley by loosening the nut.
5. Remove the worn mower belt (Figure 61).
6. Install the new mower belt around the deck pulleys and clutch pulley (Figure 61).
7. Using a ratchet in the idler arm, tighten the idler pulley until the spring is stretched 5-3/4 inches (14.6 cm) from hook to hook (Figure 61).
8. Tighten the front idler pulley by tightening the nut.
9. Install the belt covers onto the cutting unit and secure the latches.

11. After the brake is adjusted, the lever switch needs to be checked.
12. Check the gap between the brake lever and the switch as shown in Figure 60. The gap needs to be an 1/8 inch (3mm) with the brake engaged.
13. If needed, loosen the screws holding the switch and adjust the switch.

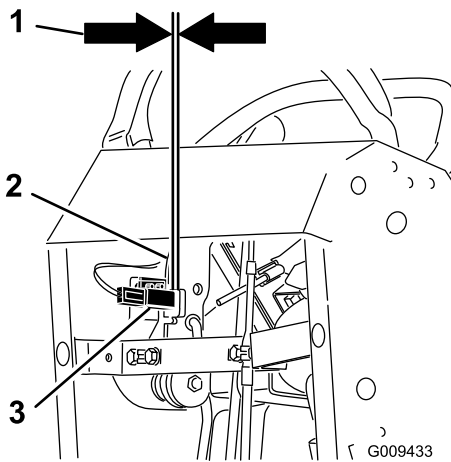


Figure 60

1. 1/8 inch (3mm) gap needed between switch and brake lever
2. Brake lever
3. Switch

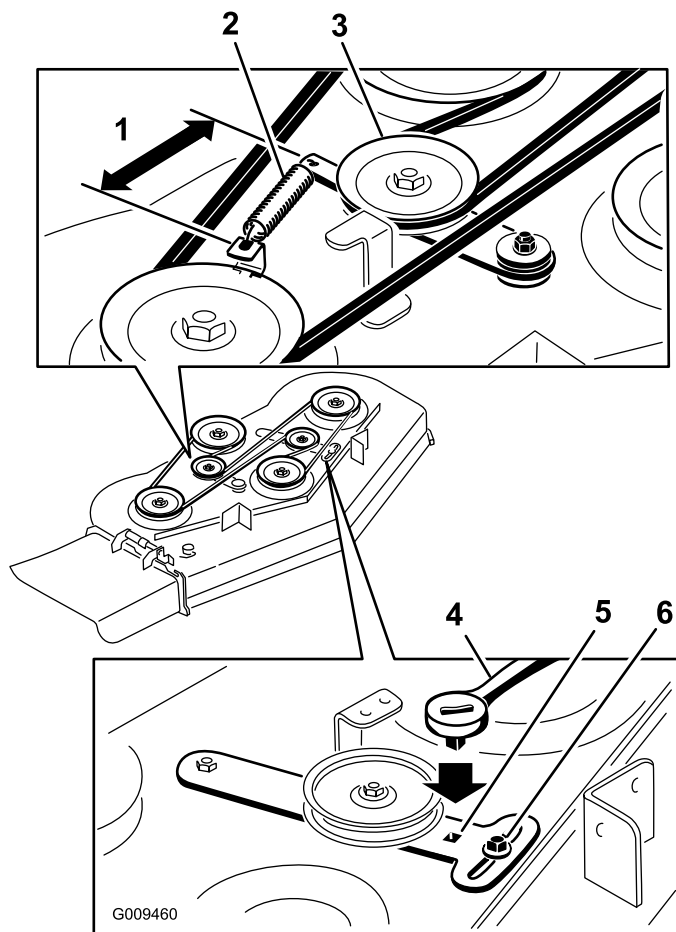


Figure 61

- | | |
|---|----------------------------|
| 1. 5-3/4 inches (14.6 cm) from hook to hook | 4. Ratchet |
| 2. Spring | 5. Square hole for ratchet |
| 3. Spring loaded idler | 6. Nut |

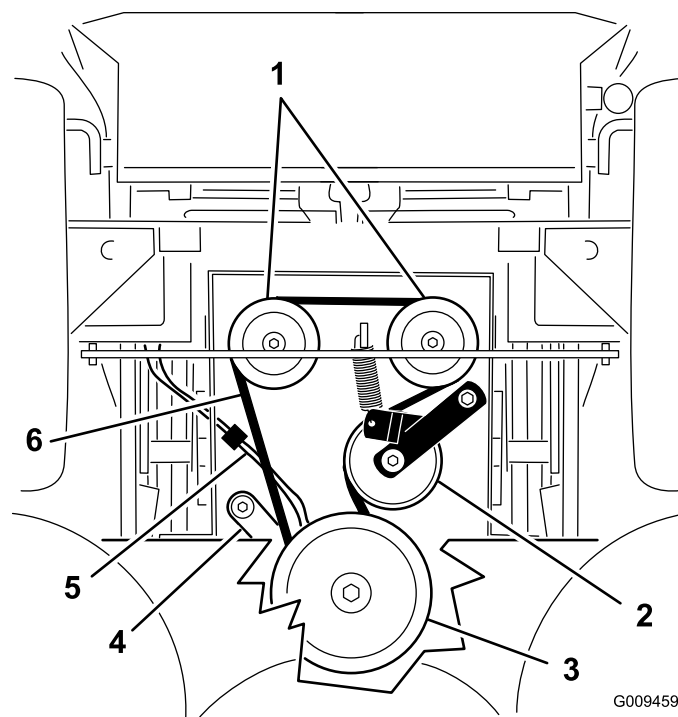


Figure 62

- | | |
|--------------------|--------------------------|
| 1. Hydraulic pumps | 4. Clutch retainer |
| 2. Idler pulley | 5. Clutch wire connector |
| 3. Clutch pulley | 6. Pump drive belt |

Replacing the Pump Drive Belt

Service Interval: Every 100 hours—Check 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 the mower deck belt.
4. Tilt the machine on it's back. Refer to Pre-Maintenance at the beginning of the Maintenance Section.
5. Disconnect the clutch wire connector from the wire harness.
6. Disconnect the clutch retainer from the engine deck (Figure 62).
7. Unhook the idler spring from the frame (Figure 62).
8. Install the new belt around clutch and the two pump pulleys.
9. Install the idler spring between idler arm and frame bracket (Figure 62).
10. Install the clutch retainer to the engine deck (Figure 62).
11. Connect the clutch wire connector to the wire harness.
12. Lower the machine to the operating position. Refer to Pre-Maintenance at the beginning of the Maintenance Section.
13. Install the mower deck belt.

Controls System Maintenance

Adjusting the Motion Control Handle Positions

Adjusting the Right Side Motion Control Lever

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

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

1. Disengage the PTO, move the right side motion control lever to the neutral position and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Push the right motion control lever down out of locked neutral position (Figure 63).
4. Check if it aligns horizontally with the left motion control lever (Figure 63).

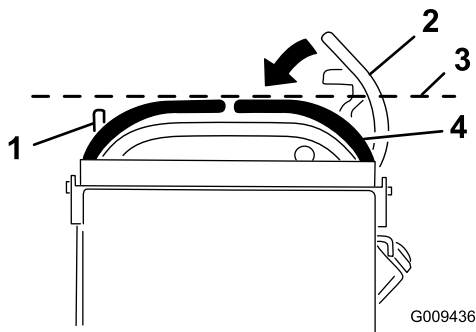


Figure 63

- | | |
|--|--|
| 1. Left motion control lever | 3. Check the horizontal alignment here |
| 2. Right motion control lever in neutral locked position | 4. Right motion control lever in neutral unlocked position |

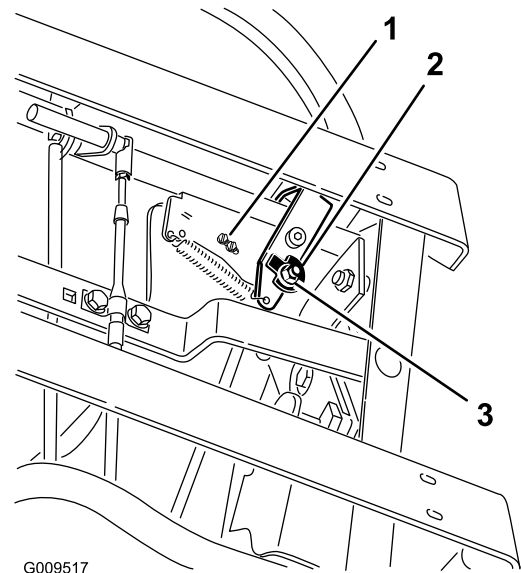


Figure 64

- | | |
|------------------|-----------------|
| 1. Switch screws | 3. Nut and bolt |
| 2. Cam | |

9. After the cam is adjusted, the lever switch needs to be checked.
10. Check the gap between the control lever and switch as shown in Figure 65. The gap needs to be an 1/8 inch (3mm) with the right motion control lever in the neutral, unlocked position.
11. If needed, loosen the screws holding the switch and adjust the switch (Figure 64 and Figure 65).

5. To adjust the right motion control lever horizontally, the cam needs to be adjusted.
6. Remove the cushion from the rear of the machine.
7. Loosen the nut and bolt holding the cam (Figure 64).
8. Adjust the cam until it aligns with the left motion control lever and tighten the nut and bolt for the cam.

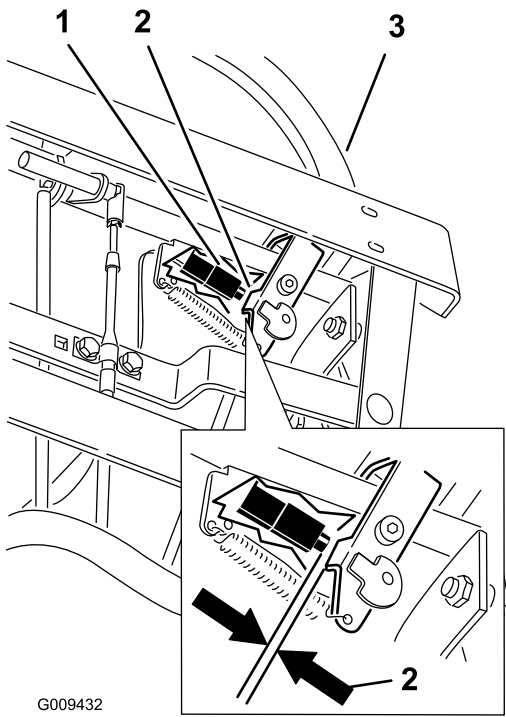


Figure 65

1. Switch
2. 1/8 inch (3mm)
3. Right motion control lever in the neutral unlocked position

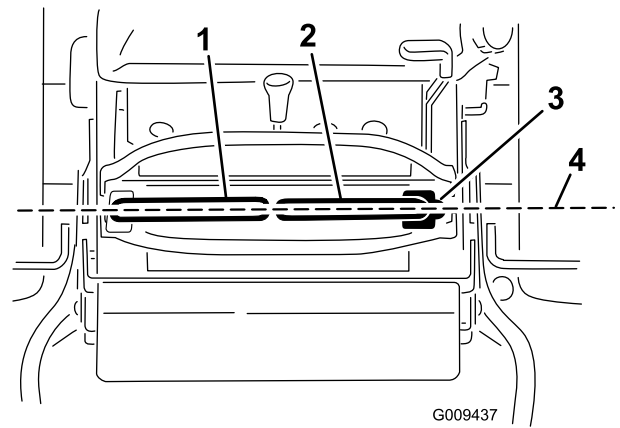


Figure 66

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

2. Rotate the thumb adjustments on either side. Adjust them in quarter-turn increments until the right side control lever moves easily into the neutral lock position and the control levers align.
3. Check for proper tracking. Refer to Adjusting the Tracking in the Maintenance Section.

12. Tighten the switch screws.

Adjusting the Neutral Position for the Motion Control Levers

Important: Ensure the tracking of the mower is correct after adjusting the motion control levers. Adjusting the tracking and aligning the motion control levers front to back is the same procedure (Figure 66).

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

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

1. After the horizontal alignment is finished, check the front to back alignment (Figure 66).

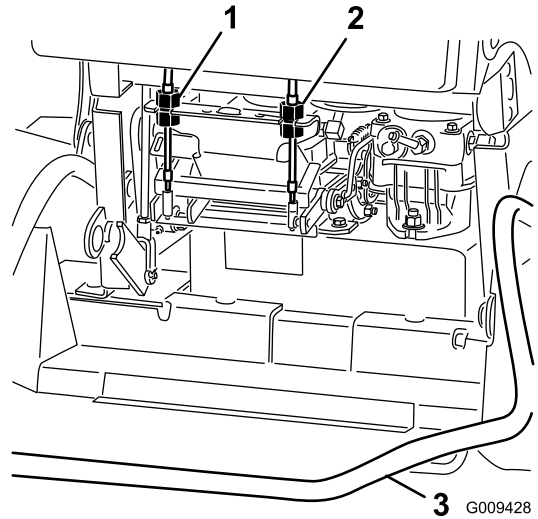


Figure 67

1. Left thumb adjustment
2. Right thumb adjustment
3. Platform down

Hydraulic System Maintenance

Servicing the Hydraulic System

Checking the Hydraulic Fluid

Service Interval: After the first 8 hours
Every 50 hours

Hydraulic Oil Type: Toro®15w-50 hydraulic oil or 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 68).

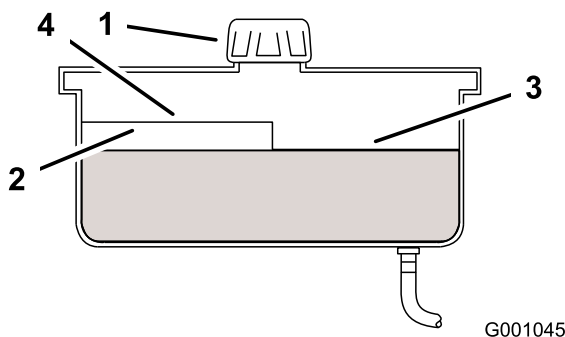


Figure 68

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

5. Remove cap from filler neck. Look inside to check the fluid level in the reservoir. (Figure 68).
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 68).

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

Service Interval: After the first 8 hours
Every 400 hours



Hot hydraulic fluid can cause severe burns.

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

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

Important: Do not substitute 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 hydraulic fluid from draining out.
4. Locate the filter under the fuel tank and place drain pan under filter (Figure 69).

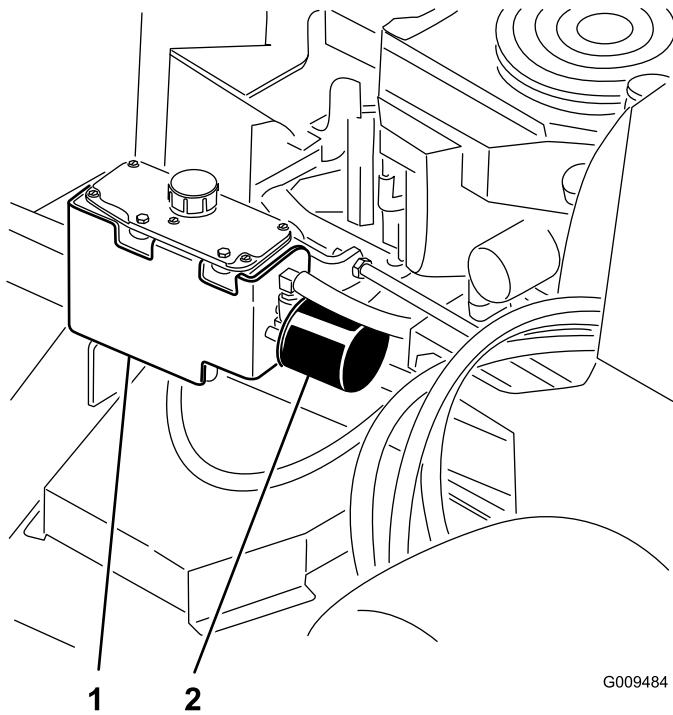


Figure 69

1. Hydraulic tank
2. Hydraulic filter

5. Remove the old filter and wipe the filter adapter gasket surface clean (Figure 70).
6. Apply a thin coat hydraulic 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 70).

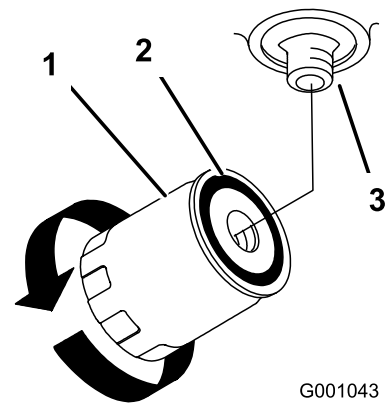


Figure 70

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.

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

Service Interval: Every 100 hours

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

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

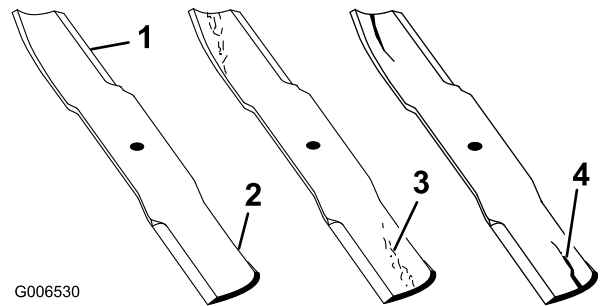
Before Inspecting or Servicing the Blades

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

Service Interval: Before each use or daily

1. Inspect the cutting edges (Figure 71). If the edges are not sharp or have nicks, remove and sharpen the blades. Refer to Sharpening the Blades.
2. Inspect the blades, especially the curved area. If you notice any cracks, wear, or a slot forming in this area immediately install a new blades (Figure 71).



G006530

Figure 71

1. Cutting Edge
2. Curved Area
3. Wear/slot Forming
4. Crack

Checking for Bent Blades

1. Disengage the PTO, move the motion control levers to the neutral locked position and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Rotate the blades until the ends face forward and backward. Measure from a level surface to the cutting edge, position **A**, of the blades (Figure 72). Note this dimension.

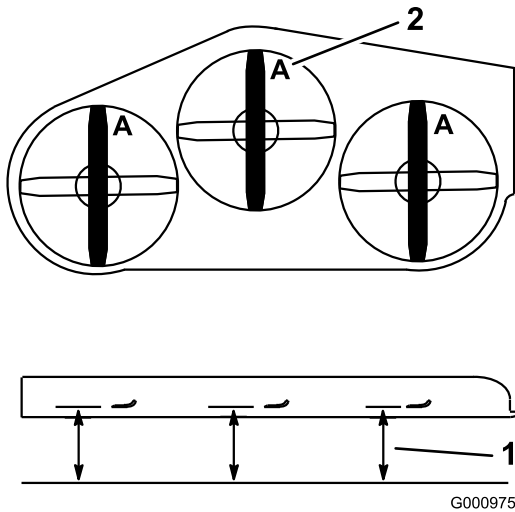


Figure 72

40 inch, 48 inch, and 52 inch Mower Deck shown

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, and blade from the spindle shaft (Figure 73).

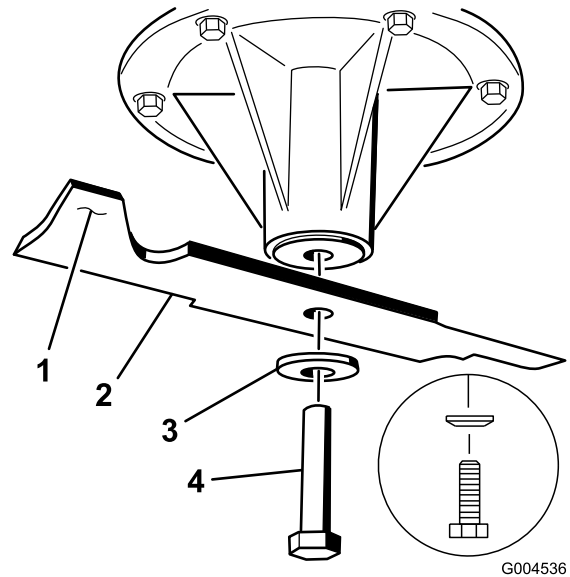


Figure 73

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

Sharpening the Blades

1. Use a file to sharpen the cutting edge at both ends of the blade (Figure 74). Maintain the original angle. The blade retains its balance if the same amount of material is removed from both cutting edges.

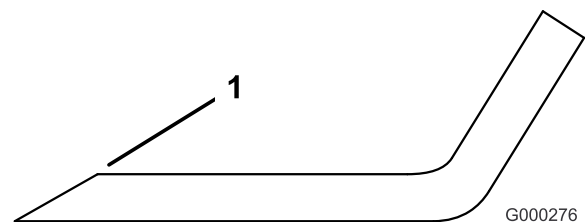


Figure 74

1. Sharpen at original angle
2. Check the balance of the blade by putting it on a blade balancer (Figure 75). 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 73). Repeat this procedure until the blade is balanced.

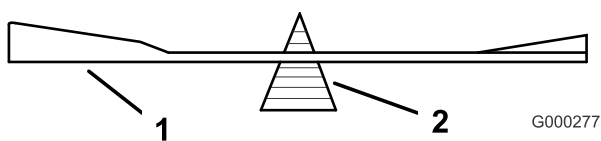


Figure 75

1. Blade
2. Balancer

Installing the Blades

1. Install the blade onto the spindle shaft (Figure 76).

Important: The curved part of the blade must be pointing upward toward the inside of the mower to ensure proper cutting.

2. Install the spring disk and blade bolt. The spring disk cone must be installed toward the bolt head (Figure 76). Torque the blade bolt to 85-110 ft-lb (115-150 N-m).

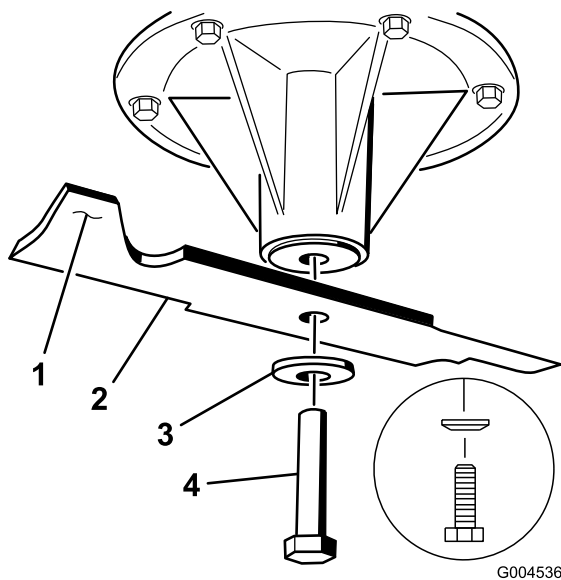


Figure 76

1. Sail Area of Blade
2. Blade
3. Spring Disk
4. Blade Bolt
5. Cone Towards Bolt Head

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 the rear 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 12-14 psi (83-97 kPa).
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 3 inch (7.6 cm) position. Refer to Adjusting the Height-Of-Cut in Operation.
6. Perform the steps in the following procedures in order.

Checking the Mower Deck Side-to-Side Height

1. Adjust the rear tire pressure.
2. Ensure the blades are not bent. Refer to Checking for Bent Blades.
3. Position the blades side-to-side. Measure at **B** and **C** locations from a level surface to the cutting edge of blade tips (Figure 77).

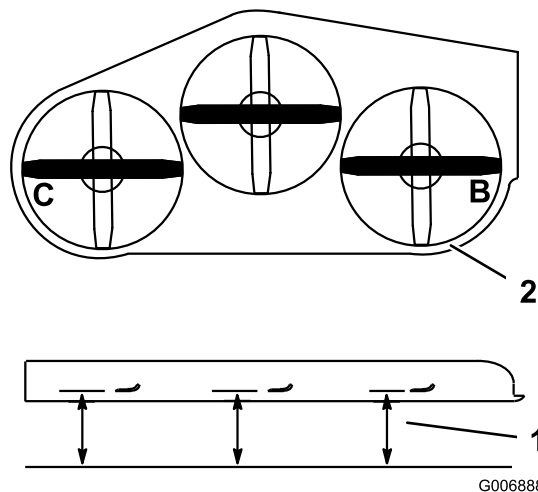


Figure 77

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

4. The difference between measurements **B** and **C** should be no more than 1/4 inch (6 mm). If it is not correct, proceed to Changing the Mower Deck Side-to-Side Height.

Changing the Mower Deck Side-to-Side Height

Changing the side-to-side height is done by adjusting the rear tire pressure and U-plates on the side of the engine deck.

1. Change the rear tire pressure. Do this to the corresponding side that needs adjustment.
2. Locate the U-plates on the side of the engine deck (Figure 78).
3. Loosen the U-plate on one side and adjust it up or down to make the difference between measurements **B** and **C** no more than a 1/4 inch (6 mm) (Figure 78).
4. Proceed to Checking the Mower Deck Front-to-Rear Pitch.

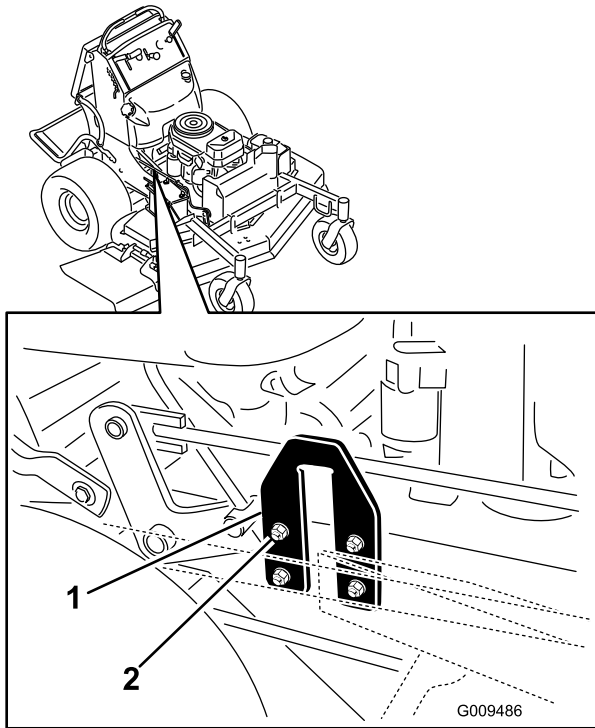


Figure 78

1. U-plate
2. Nuts and bolts

Checking the Mower Deck Front-to-Rear Pitch

1. Adjust the tire pressure in the rear tires to specifications.
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 79).
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.

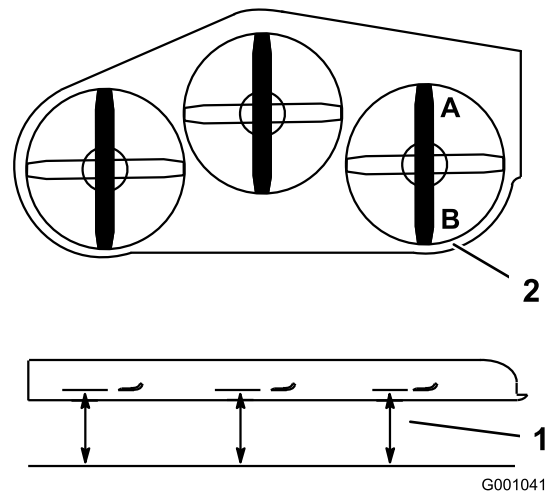


Figure 79

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. Place 3 pieces of 2x4 wood under the mower deck as shown in Figure 80. Stand the 2x4's on the 4 inch part.

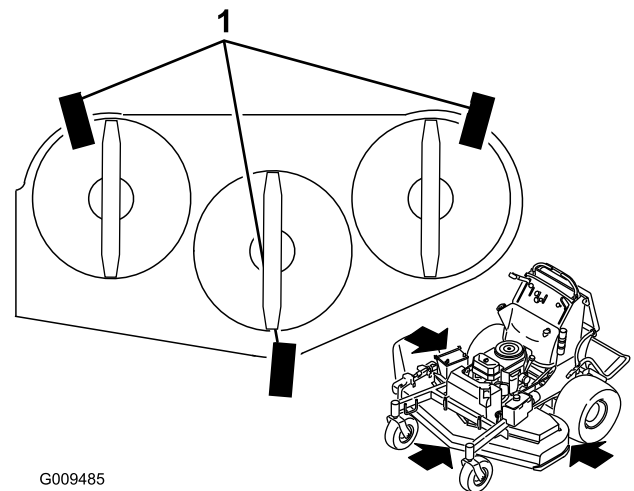


Figure 80

1. 2x4 piece of wood under mower deck
2. Loosen both the front and rear nuts on the adjustment rods (Figure 81).
3. The weight of the mower deck must be resting on all three of the 2x4's (Figure 81). The back lip of the mower deck is built a 1/4 inch (6mm) lower than the front lip of the mower deck.
4. Tighten both the front and rear nuts.

5. Check the front-to-rear pitch of the cutting unit.
6. If the dimensions are not correct, adjust the front and rear nuts on either side to get the correct front-to-rear pitch (Figure 81).

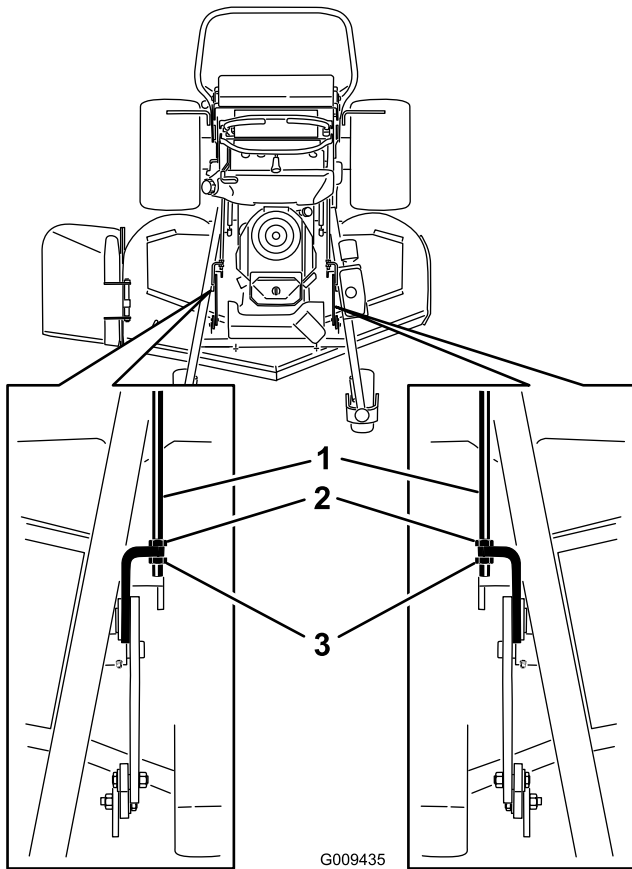
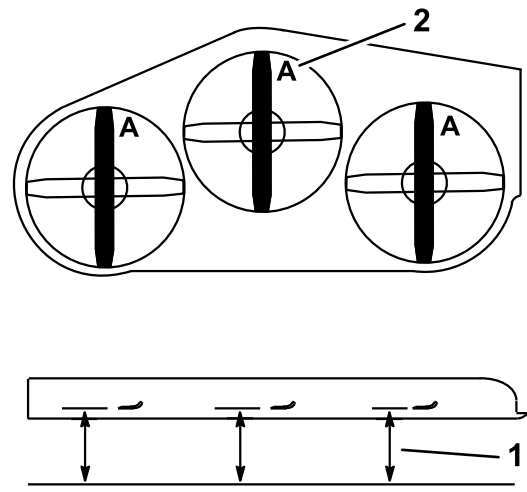


Figure 81

1. Adjustment rods
2. Rear nuts
3. Front nuts

Matching Height of Cut

1. Check the rear tire pressure.
2. Set the height-of-cut to the 3 inch (7.6 cm) position. Refer to Adjusting the Height-Of-Cut in Operation.
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 82).

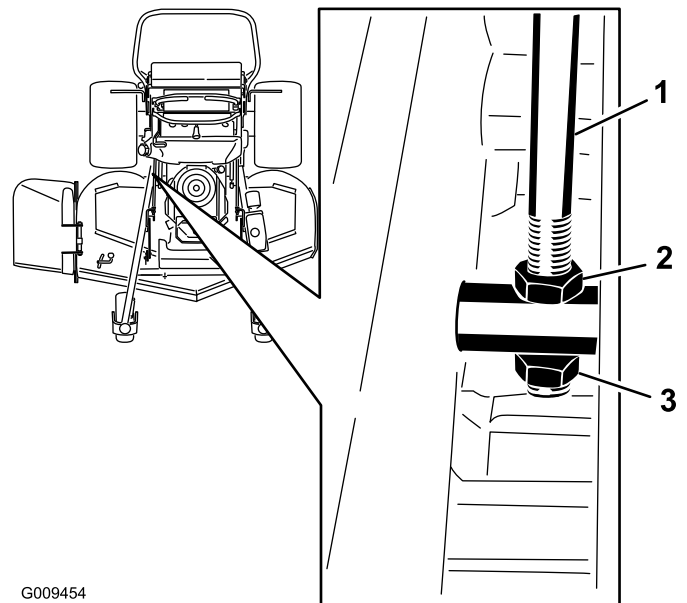


G000975

Figure 82

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

4. The measurement should be 3 inch (7.6 cm).
5. If it does not measure correctly, locate the height-of-cut rod on the right side of the machine (Figure 83).
6. Loosen the jam nut and adjust the adjustment nut until the blade tips match 3 inches (7.6 cm) (Figure 83).
7. When the adjustment is correct, tighten the jam nut (Figure 83).



G009454

Figure 83

1. Height-of-cut rod
2. Jam nut
3. Adjustment nut

Replacing the Grass Deflector

position and ensure that it rotates into the full down position.



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 84). Remove damaged or worn grass deflector.

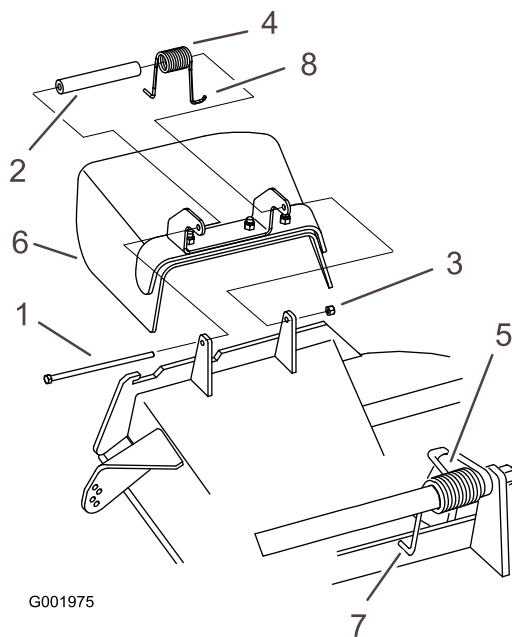


Figure 84

- | | |
|------------|---|
| 1. Bolt | 5. Spring installed |
| 2. Spacer | 6. Grass Deflector |
| 3. Locknut | 7. L end of spring, place behind deck edge before installing bolt |
| 4. Spring | 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 84.

3. Install bolt and nut. Place the **J** hook end of spring around grass deflector (Figure 84).

Important: The grass deflector must be able to rotate. Lift the deflector up to the full open

Cleaning

Cleaning Under the Mower

Service Interval: Before each use or daily

Remove the grass buildup under the mower daily.

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

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 42.
 4. Service the air cleaner; refer to Servicing the Air Cleaner in Engine Maintenance , page 30.
 5. Grease the machine; refer to Greasing and Lubrication in Lubrication , page 29.
 6. Change the engine oil; refer to Servicing the Engine in Engine Maintenance , page 30.
 7. Check the tire pressure; refer to Checking the Tire Pressure in Drive System Maintenance , page 39.
 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 35, 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 30. 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).

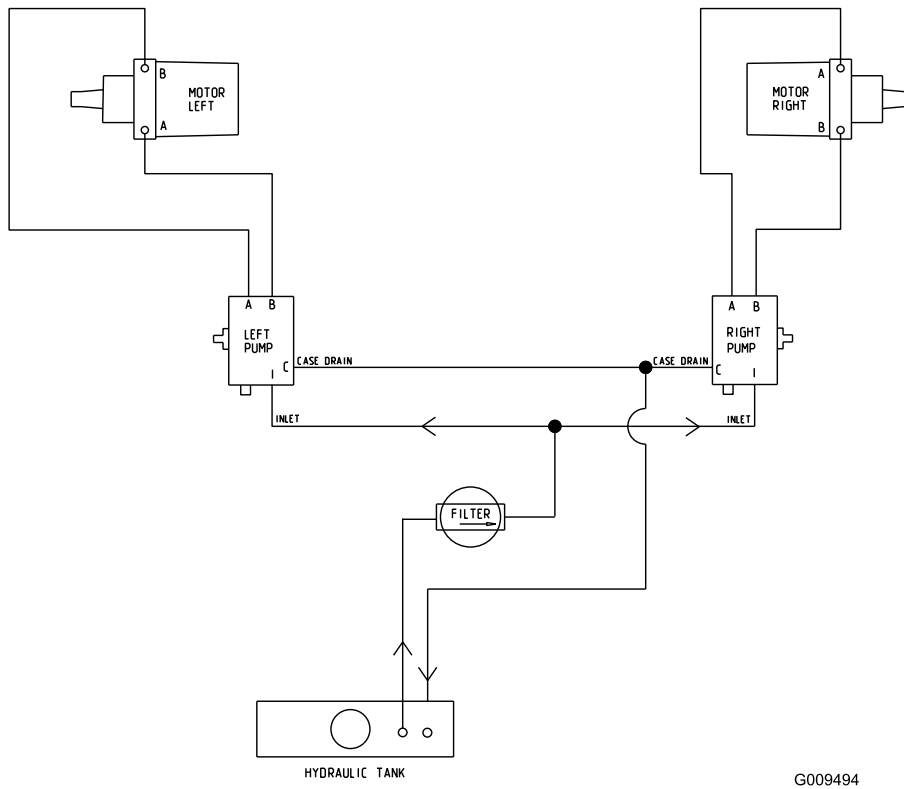
10. Check and tighten all bolts, nuts, and screws. Repair or replace any part that is damaged or defective.
11. Paint all scratched or bare metal surfaces. Paint is available from your Authorized Service Dealer.
12. Store the machine in a clean, dry garage or storage area. Remove the key from the ignition 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.	<ol style="list-style-type: none"> 1. Fuel tank is empty. 2. Choke is not on. 3. Spark plug wire is loose or disconnected. 4. Spark plug is pitted, fouled, or the gap is incorrect. 5. Air cleaner is dirty. 6. Dirt in the fuel filter. 7. Dirt, water, or stale fuel is in the fuel system. 8. The gap between the safety interlock switches is not correct. 	<ol style="list-style-type: none"> 1. Fill fuel tank with gasoline. 2. Move the choke lever to choke position. 3. Install wire on spark plug. 4. Install a new, correctly gapped spark plug. 5. Service the air cleaner element. 6. Replace the fuel filter. 7. Contact an Authorized Service Dealer. 8. Contact an Authorized Service Dealer.
Engine loses power.	<ol style="list-style-type: none"> 1. Engine load is excessive. 2. Air cleaner is dirty. 3. Oil level in the crankcase is low. 4. Cooling fins and air passages under the engine blower housing are plugged. 5. Spark plug is pitted, fouled, or the gap is incorrect. 6. Vent hole in the fuel cap is plugged. 7. Dirt in the fuel filter. 8. Dirt, water, or stale fuel is in the fuel system. 	<ol style="list-style-type: none"> 1. Reduce the ground speed. 2. Service the air cleaner. 3. Add oil to the crankcase. 4. Remove the obstruction from the cooling fins and air passages. 5. Install a new, correctly gapped spark plug. 6. Clean or replace the fuel cap. 7. Replace the fuel filter. 8. Contact an Authorized Service Dealer.
Engine overheats.	<ol style="list-style-type: none"> 1. Engine load is excessive. 2. Oil level in the crankcase is low. 3. Cooling fins and air passages under the engine blower housing are plugged. 	<ol style="list-style-type: none"> 1. Reduce the ground speed. 2. Add oil to the crankcase. 3. Remove the obstruction from the cooling fins and air passages.
Machine does not drive.	<ol style="list-style-type: none"> 1. Hydraulic oil reservoir low. 2. Air in the hydraulic system. 3. Pump drive belt slipping. 4. Pump drive belt idler spring missing. 5. Pump by-pass valves are open. 	<ol style="list-style-type: none"> 1. Add hydraulic oil to the reservoir. 2. Bleed the air out the hydraulic system. 3. Replace the pump drive belt. 4. Replace the pump drive belt idler spring. 5. Tighten the by-pass valves.
Abnormal vibration.	<ol style="list-style-type: none"> 1. Cutting blade(s) is/are bent or unbalanced. 2. Blade mounting bolt is loose. 3. Engine mounting bolts are loose. 4. Loose engine pulley, idler pulley, or blade pulley. 5. Engine pulley is damaged. 6. Blade spindle is bent. 	<ol style="list-style-type: none"> 1. Install new cutting blade(s). 2. Tighten the blade mounting bolt. 3. Tighten the engine mounting bolts. 4. Tighten the appropriate pulley. 5. Contact an Authorized Service Dealer. 6. Contact an Authorized Service Dealer.
Uneven cutting height.	<ol style="list-style-type: none"> 1. Blade(s) not sharp. 2. Cutting blade(s) is/are bent. 3. Mower deck is not level. 4. Mower deck pitch is wrong. 5. Underside of mower deck is dirty. 6. Tire pressure is not correct. 7. Blade spindle bent. 	<ol style="list-style-type: none"> 1. Sharpen the blade(s). 2. Install new cutting blade(s). 3. Level the mower deck side-to-side position. 4. Adjust the front-to-rear pitch. 5. Clean the underside of the mower deck. 6. Adjust the tire pressure. 7. Contact an Authorized Service Dealer.

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

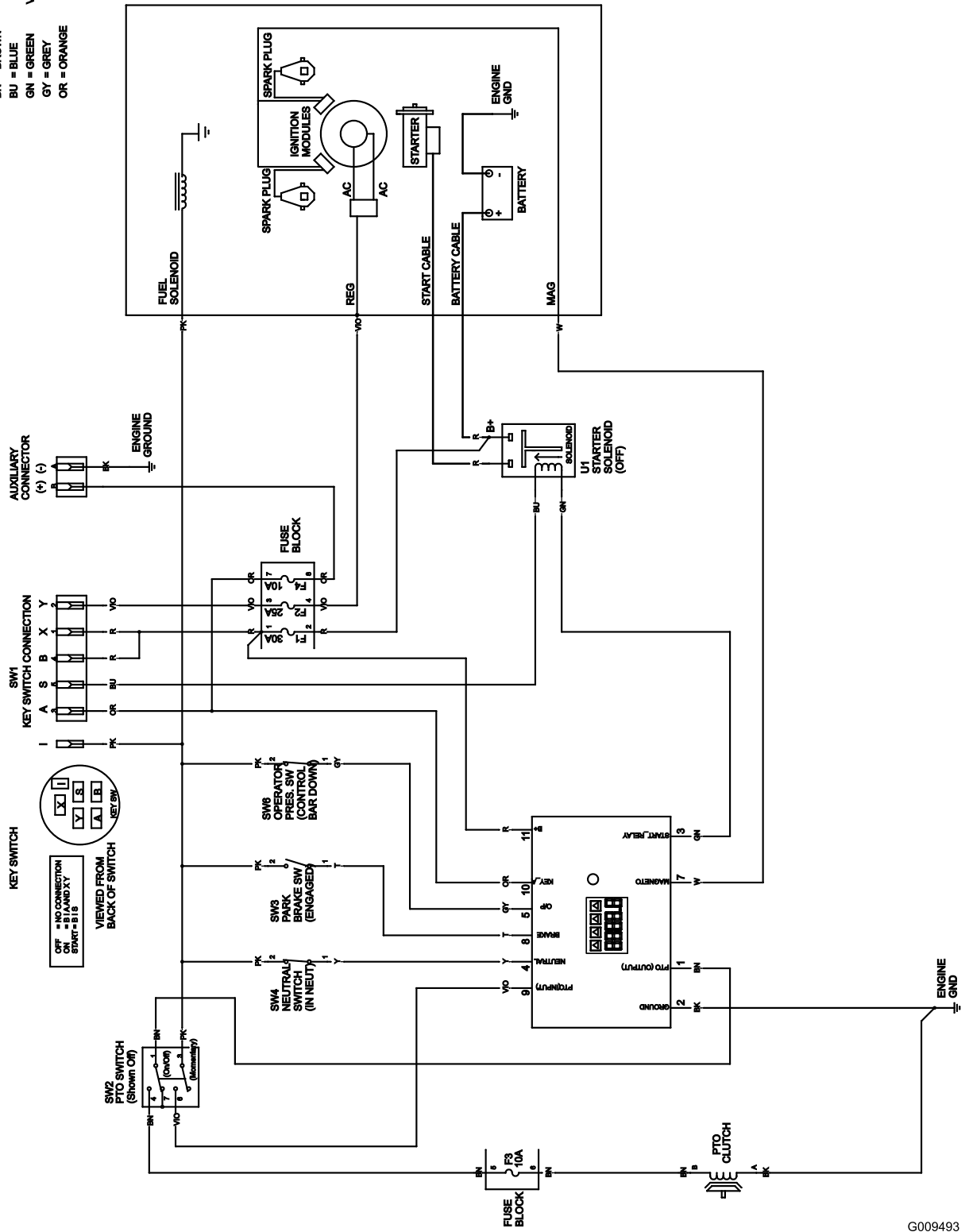
Schematics



Hydraulic Schematic (Rev. A)

G009494

- WIRE COLOR CODES**
- BK = BLACK
 - BN = BROWN
 - BU = BLUE
 - GN = GREEN
 - GY = GREY
 - OR = ORANGE
 - PK = PINK
 - R = RED
 - T = TAN
 - VO = VIOLET
 - W = WHITE
 - Y = YELLOW



Electrical Schematic (Rev. A)

G009493

Notes:

Notes:

Notes:



The Toro Total Coverage Guarantee

A Limited Warranty (see warranty periods below)

Landscape Contractor Equipment (LCE)

Conditions and Products Covered

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

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

Product	Warranty Period
Mid-Size Walk-Behind Mowers	2 years**
GrandStand™ Mowers <ul style="list-style-type: none"> • Engine • Frame 	5 years or 1,200 hours* 2 years** Lifetime (original owner only)***
Z Master® Z300, Z400, Z500 Mowers <ul style="list-style-type: none"> • Engine • Frames 	4 years or 1,200 hours* 2 years** Lifetime (original owner only)***
Z Master® G3 Mowers <ul style="list-style-type: none"> • Engine • Frame 	5 years or 1,200 hours* 2 years** Lifetime (original owner only)***
Batteries (for above units)	1 year
Attachments (for above units)	1 year

*Whichever occurs first.

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

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

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

Instructions for Obtaining Warranty Service

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

1. Contact any Authorized Toro Service Dealer to arrange service at their dealership. To locate a dealer convenient to you, refer to the *Yellow Pages* of your telephone directory (look under "Lawn Mowers") or access our web site at www.Toro.com. You may also call the numbers listed in item #3 to use the 24-hour Toro Dealer locator system.
2. Bring the product and your proof of purchase (sales receipt) to the Service Dealer. The dealer will diagnose the problem and determine if it is covered under warranty.
3. If for any reason you are dissatisfied with the Service Dealer's analysis or with the assistance provided, contact us at:
LCB Customer Service Department
Toro Warranty Company
8111 Lyndale Avenue South
Bloomington, MN 55420-1196
888-865-5676 (U.S. Customers)
888-865-5691 (Canada customers)

Countries Other than the United States or Canada

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

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 and engine warranty coverage on some products.

This express warranty does not cover:

- 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.

General Conditions

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

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

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

Some states do not allow exclusions of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above exclusions and limitations may not apply to you.

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