



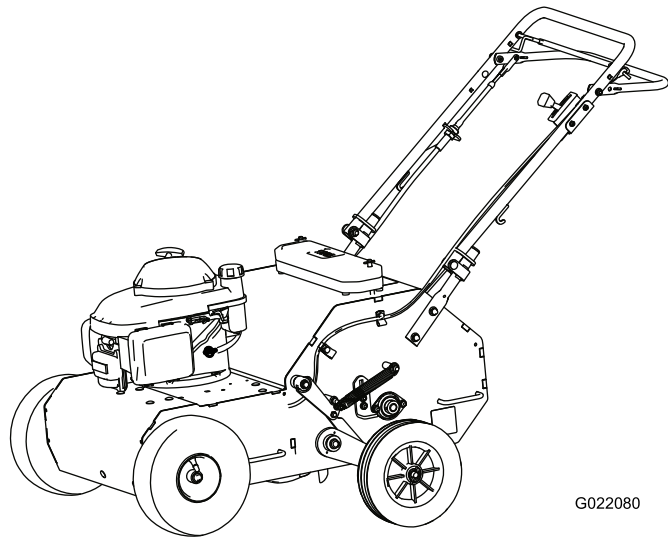
**Count on it.**

**Operator's Manual**

# 18in Walk-Behind Aerator

Model No. 23516—Serial No. 313000001 and Up

Model No. 33516—Serial No. 313000001 and Up



G022080



## ⚠ WARNING

### CALIFORNIA Proposition 65 Warning

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

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

This spark ignition system complies with Canadian ICES-002.

Because in some areas there are local, state, or federal regulations requiring that a spark arrester be used on the engine of this machine, a spark arrester is available as an option. If you require a spark arrester, contact your Authorized Toro Service Dealer.

Genuine Toro spark arresters are approved by the USDA Forestry Service.

**Important:** 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 without a spark arrester muffler maintained in working order, or the engine constricted, equipped, and maintained for the prevention of fire. Other states or federal areas may have similar laws.

## Introduction

This aerator, which is controlled by a walking operator, is intended to be used by trained operators in residential and commercial applications. It is primarily designed for aerating small to mid-sized areas of well-maintained lawns on residential grounds, parks, sports fields, and on commercial grounds.

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](http://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 illustrates the location of the

model and serial numbers on the product. Write the numbers in the space provided.

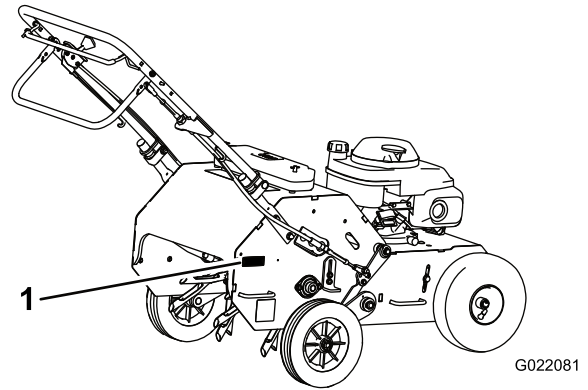


Figure 1

1. Location of the model and serial numbers

Model No. \_\_\_\_\_

Serial No. \_\_\_\_\_

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



Figure 2

1. Safety alert symbol

This manual uses 2 words to highlight information.

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

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# Safety

**Improperly using or maintaining the machine can result in injury. To reduce the potential for injury, comply with these safety instructions and always pay attention to the safety alert symbol, which means *Caution, Warning, or Danger*—personal safety instruction. Failure to comply with the instruction may result in personal injury or death.**

## Safe Operating Practices

The following instructions are adapted from the ANSI B71.4-2004 and B71.8-2004 standard.

### Training

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

### Preparation

- Evaluate the terrain to determine what accessories and attachments are needed to properly and safely perform the job. Only use accessories and attachments approved by the manufacturer.
- Wear appropriate clothing including 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 contacted 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 the gas cap or add fuel with the engine running.
  - Allow the engine to cool before fueling.
  - Do not smoke.
  - Never fuel the machine or drain the fuel tank indoors.
- Check that the 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 before starting engine.
- Never operate without the shields, covers, or other guards securely in place. Be sure all interlocks are functioning properly.
- Do not change the engine governor setting or overspeed the engine.
- Raise the tines, stop the machine, and stop the engine before leaving the operator's position for any reason.
- Stop the equipment and inspect the tines after striking an object or if an abnormal vibration occurs. Make necessary repairs before resuming operation.
- Keep hands and feet away from the tine area.
- Never carry passengers and keep pets and bystanders away.
- Be alert, slow down, and use caution when making turns. Look behind and to the side before changing directions.
- Slow down and use caution when crossing roads and sidewalks.
- Do not operate the machine under the influence of alcohol or drugs.
- Lightning can cause severe injury or death. If lightning is seen or thunder is heard in the area, do not operate the machine; seek shelter.
- Use extreme care when loading or unloading the machine into or out of a trailer or truck.
- Use care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.
- Always be aware of obstacles that may be in the area of operation. Plan your aeration path to avoid contact with any obstacle by you or the machine.
- Clean grass and debris from the tines, drives, muffler, and engine to help prevent fires. Clean up oil or fuel spillage.
- Let the engine cool before storing and do not store near flame.
- Shut off the fuel while storing or transporting on trailers. Do not store fuel near flames or drain indoors.
- Park the machine on level, hard ground. Never allow untrained personnel to service it.
- Use jack stands or safety latches to support the machine when working under it.
- Remove the spark-plug wire before making any repairs.
- 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.
- Use only Toro-approved attachments. The warranty may be voided if the machine is used with unapproved attachments.

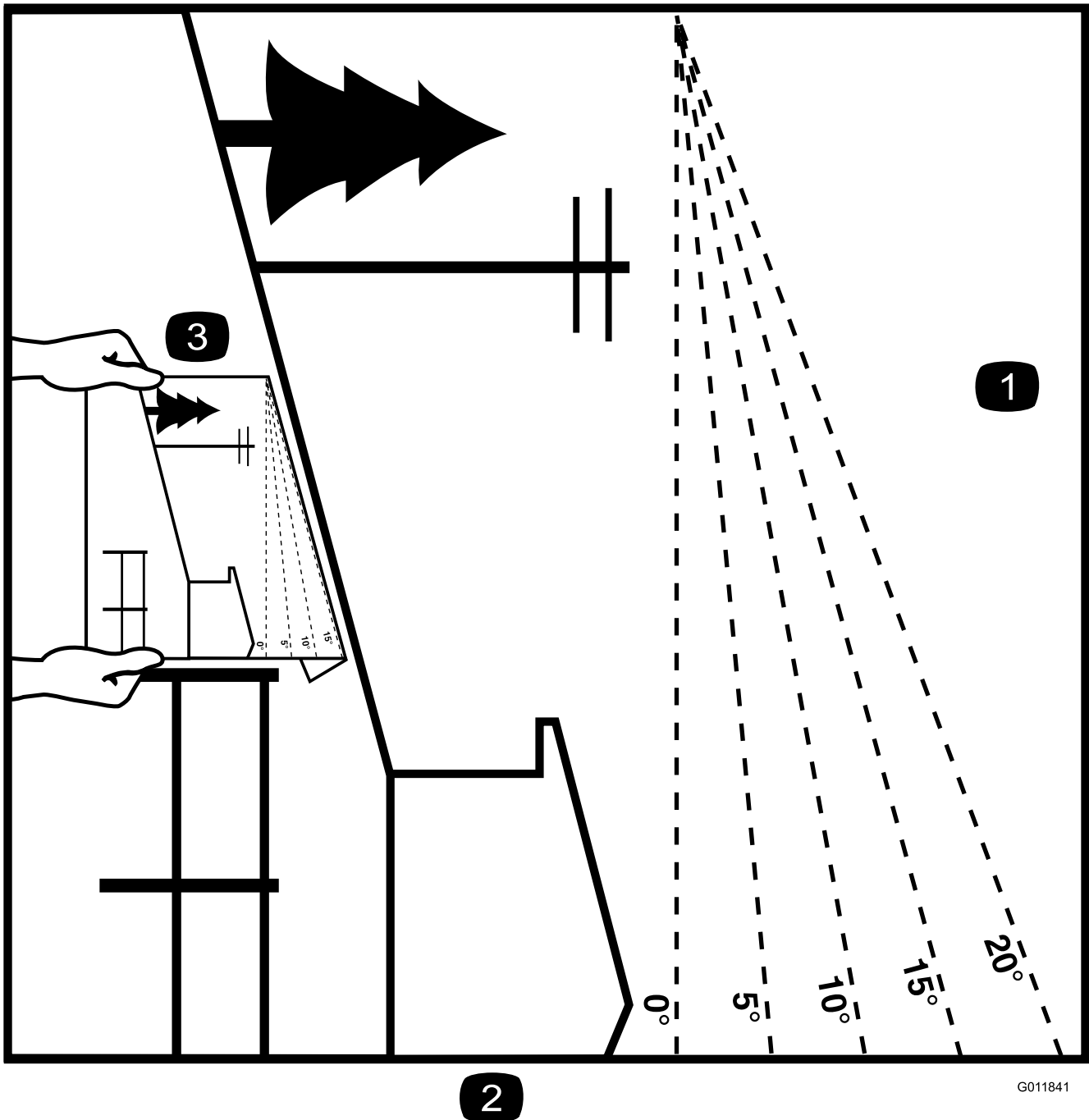
## Slope Operation

- Do not operate on slopes when grass is wet. Slippery conditions reduce traction and could cause sliding and loss of control.
- Do not make sudden turns or rapid speed changes.
- Reduce speed and use extreme caution on slopes.
- Remove or mark obstacles such as rocks, tree limbs, sprinkler heads, etc. from the operating area. Tall grass can hide obstacles.

## Maintenance and Storage

- Wait for all movement to stop before adjusting, cleaning, or repairing. Raise the tines, stop the machine, stop the engine, and disconnect the spark-plug wire.

# Slope Indicator



2

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Figure 3

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

# Safety and Instructional Decals



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

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

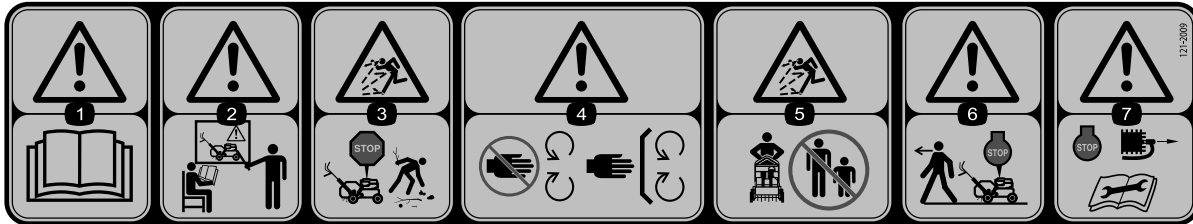
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121-6229

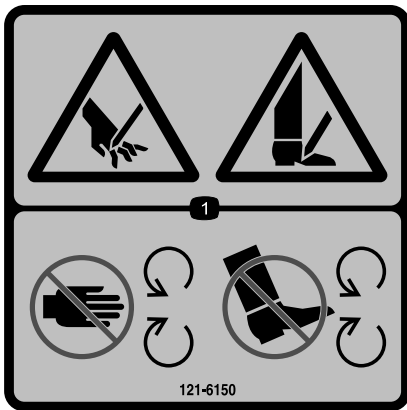
1. Off

2. On



121-2009

- |  |   |  |  |
|--|---|--|--|
| <p>1. Warning—read the <i>Operator's Manual</i>.</p> <p>2. Warning—do not operate this machine unless you are trained.</p> | <p>3. Thrown object hazard—stop the machine and pick up debris before operating.</p> <p>4. Warning—keep hands away from moving parts, keep all guards and shields in place.</p> | <p>5. Thrown object hazard—keep bystanders a safe distance from the machine.</p> <p>6. Warning—stop the engine before leaving the machine.</p> | <p>7. Warning—stop the engine and remove the spark plug wire before performing any maintenance on the machine.</p> |
|--|---|--|--|



121-6150

1. Cutting hazard of hand and foot—stay away from moving parts.



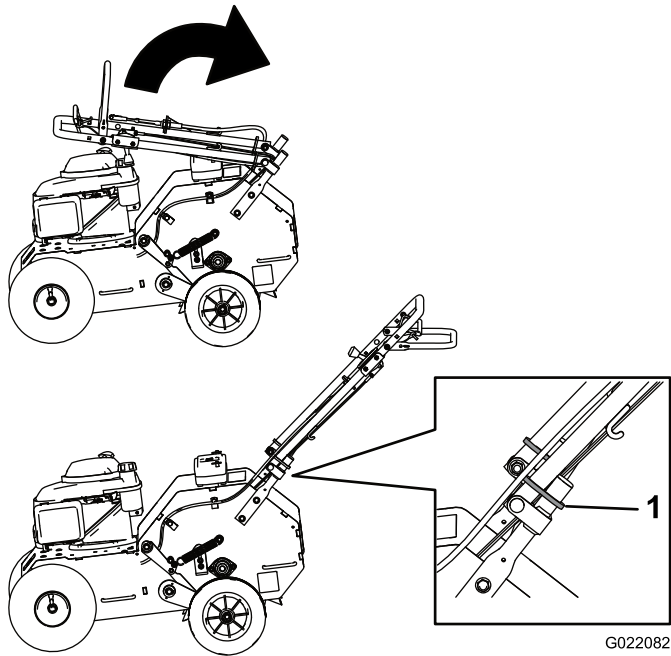
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- |                                |                |
|--------------------------------|----------------|
| <p>1. Choke</p> <p>2. Fast</p> | <p>3. Slow</p> |
|--------------------------------|----------------|

# Setup

## Unfolding the Handle

1. Raise the handle to the operating position.



**Figure 4**

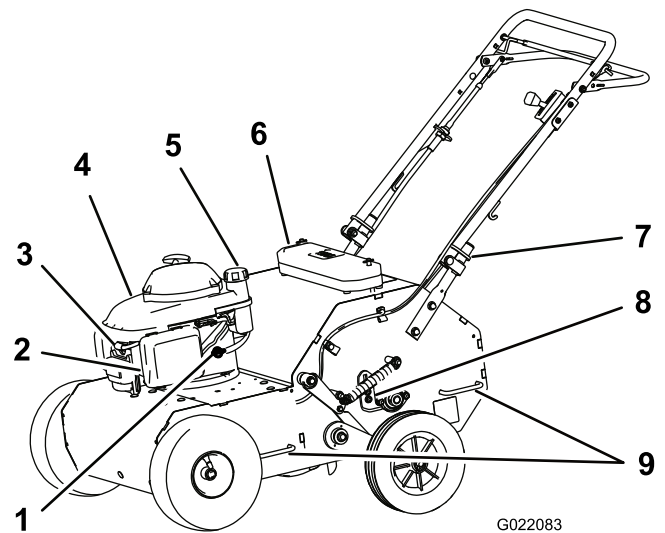
1. Handle-locking ring

2. Slide the handle-locking ring down each side of the upper handle over the lower handle, locking the handle sections together.

## Checking the Engine Oil Level

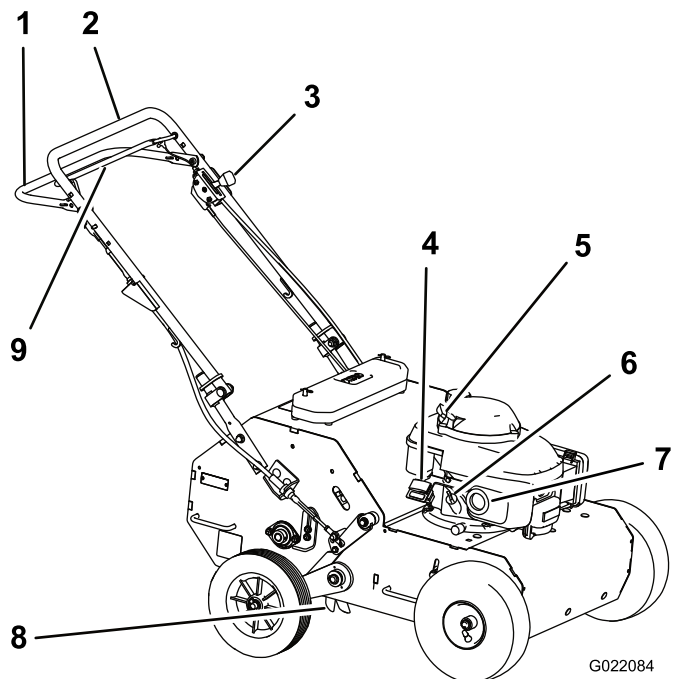
Before operating, check the engine oil level to ensure that it has enough oil. The machine comes from the factory with oil in the engine crankcase; however, you may need to add oil. Refer to Changing the Engine Oil (page 16), for oil specifications and instructions.

# Product Overview



**Figure 5**

- |                    |                        |
|--------------------|------------------------|
| 1. Fuel valve      | 6. Weights             |
| 2. Air cleaner     | 7. Handle-locking ring |
| 3. Spark-plug wire | 8. Wheel stop          |
| 4. Engine          | 9. Tie-down/lift loops |
| 5. Fuel-tank cap   |                        |



**Figure 6**

- |                        |                          |
|------------------------|--------------------------|
| 1. Tine-control lever  | 6. Dipstick              |
| 2. Handle              | 7. Muffler               |
| 3. Throttle lever      | 8. Tines                 |
| 4. Engine switch       | 9. Traction-control bail |
| 5. Recoil-start handle |                          |

# Controls

## Engine Switch

When the engine switch is in the On position, it allows the engine to run. Moving the engine switch to the Off position stops the engine.

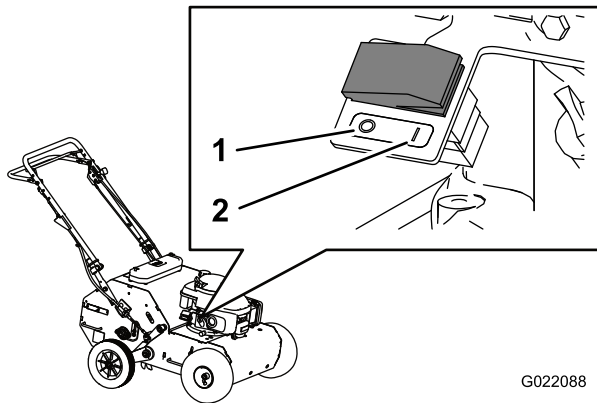


Figure 7

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1. Off
2. On

## Recoil-start Handle

Pull the recoil-start handle (Figure 6) to start the engine.

## Fuel Valve

Open the fuel valve to allow fuel to flow to the engine. Close the fuel valve when transporting or storing the machine (Figure 5).

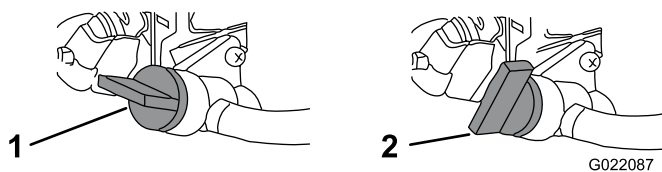


Figure 8

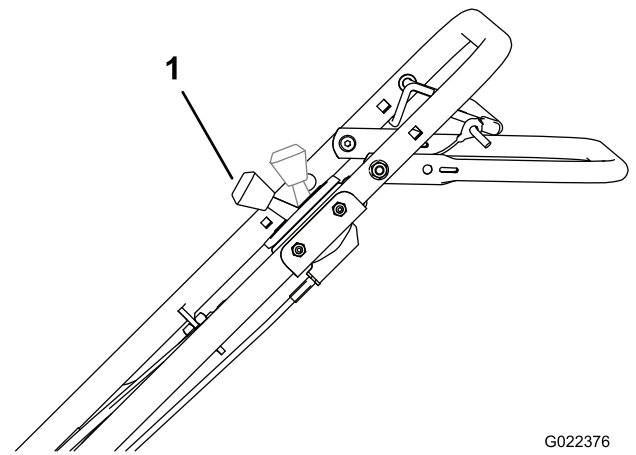
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1. Open position
2. Closed position

## Throttle Lever

Before starting a cold engine, move the throttle lever (Figure 9) forward to the Choke position. After the engine starts, pull the throttle lever back to the Fast position.

**Note:** A warm engine requires little or no choking.



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Figure 9

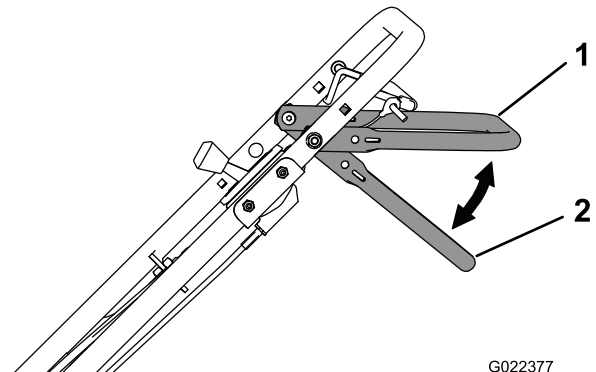
1. Throttle lever

## Traction-control Bail

The traction-control bail (Figure 6) controls the forward and neutral actions of the machine. Refer to *Driving the Machine* (page 11) for more information.

## Tine-control Lever

The tine-control lever (Figure 10) lifts the rear wheels, causing the rear of the machine to be supported on the aerating tines. Push the tine-control lever down to engage the tines. Pull it up to disengage the tines.



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Figure 10

1. Tine-control lever—disengaged
2. Tine-control lever—engaged



# Specifications

Length (operating)	146 cm (57.5 inches)
Length (with handle stored)	96.5 cm (38 inches)
Width	74 cm (29 inches)
Height (operating)	109 cm (43 inches)
Height (with handle stored)	71 cm (28 inches)
Weight (as shipped with 2 weights)	135.6 kg (299 lb)

# Operation

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

## Checking the Engine Oil Level

**Service Interval:** Before each use or daily

**Note:** Toro Premium Engine Oil is available from your Authorized Toro Dealer.

**Important:** Use 4-cycle engine oil that meets or exceeds the requirements for API service category SJ, SL, SM, or higher.

**Crankcase Capacity:** 0.55 L (18.6 fl oz)

**Viscosity:** Refer to Figure 11.

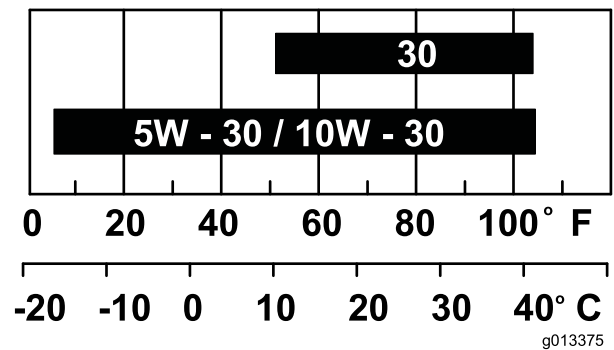


Figure 11

1. Move the machine to a level surface; stop the engine and allow it to cool.
2. Clean around the dipstick (Figure 12).
3. Remove the dipstick by rotating the cap counterclockwise and pulling it out.

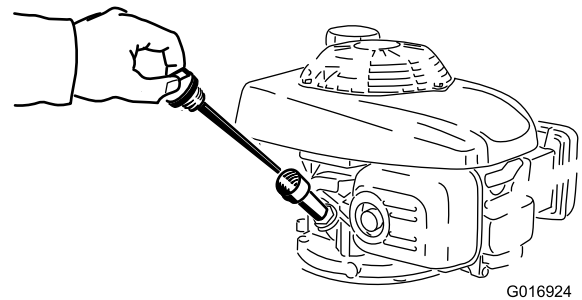
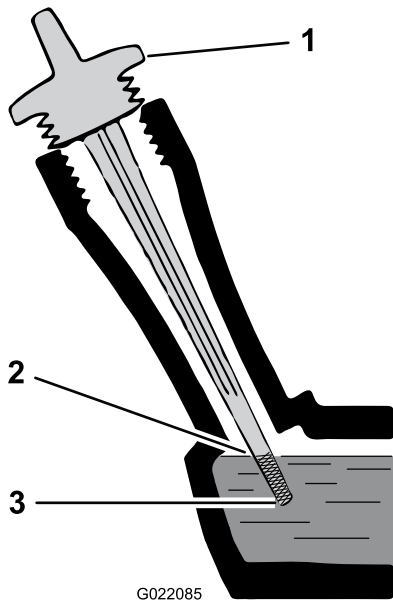


Figure 12

4. Wipe the dipstick clean with a clean cloth.
5. Insert the dipstick into the filler neck, but **do not rotate the cap clockwise to secure it** (Figure 13), then remove it.



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**Figure 13**

- |                     |                     |
|---------------------|---------------------|
| 1. Dipstick         | 3. Lower-limit mark |
| 2. Upper-limit mark |                     |

6. Read the oil level on the dipstick.
7. If the oil level is below the lower-limit mark on the dipstick, **slowly** pour only enough oil into the filler hole to raise the oil level to the upper-limit mark on the dipstick.

**Note:** Allow the oil to settle before checking the oil level again.

**Important:** Do not overfill the crankcase with oil and run the engine; engine damage will result. Drain the excess oil until the oil level reaches the upper-limit mark on the dipstick.

8. Insert the dipstick into the filler neck, and rotate the cap clockwise until it is tight.

## Filling the Fuel Tank

Capacity: 0.93 L (0.25 US gallons)

### **⚠ DANGER**

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

- Fill the fuel tank outdoors, in an open area, and when the engine is cold. Wipe up any gasoline that spills.
- Do not fill the fuel tank completely full. Add gasoline to the fuel tank until the level is 6 to 13 mm (1/4 to 1/2 inch) below the bottom of the filler neck. This empty space in the tank allows the gasoline to expand.
- Never smoke when handling gasoline, and stay away from an open flame or where a spark may ignite the gasoline fumes.
- Store gasoline in an approved fuel container and keep it out of the reach of children.
- Do not buy more than a 30-day supply of gasoline.

### **⚠ DANGER**

When fueling, under certain circumstances, a static charge can develop, igniting the gasoline. A fire or explosion from gasoline can burn you and others and damage property.

- Always place gasoline containers on the ground and 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 gasoline-powered equipment from the truck or trailer and fuel the equipment with the wheels on the ground. If this is not possible, then fuel such equipment on a truck or trailer from a portable container, not from a gasoline-dispenser nozzle.
- If you must use a gasoline-dispenser nozzle, keep the nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete.
- For best results, use only clean, fresh, unleaded gasoline with an octane rating of 87 or higher (rating method: (R+M)/2).

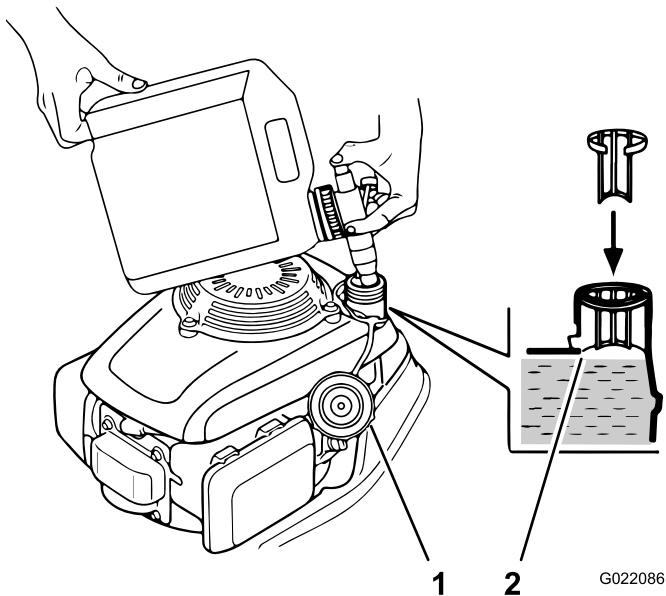
**Note:** Fresh fuel is less than 30 days old.

- Oxygenated fuel with up to 10% ethanol or 15% MTBE by volume is acceptable.
- Do not use ethanol blends of gasoline (such as E15 or E85) with more than 10% ethanol by volume. Performance problems and/or engine damage may result which may not be covered under warranty.
- Do not use gasoline containing methanol.
- Do not store fuel either in the fuel tank or fuel containers over the winter unless a fuel stabilizer is used.
- Do not add oil to gasoline.

**Important:** Do not use fuel additives other than a fuel stabilizer/conditioner. Do not use fuel stabilizers with an alcohol base such as ethanol, methanol, or isopropanol.

1. Clean around the fuel-tank cap.
2. Remove the cap from the tank.
3. Fill the fuel tank with unleaded gasoline to within 6 to 13 mm (1/4 to 1/2 inch) from the top of the tank. **Do not fill into the filler neck.**

**Important:** Do not fill the tank more than 6 mm (1/4 inch) from the top of the tank, because the gasoline must have room to expand.



**Figure 14**

1. Fuel-tank cap
2. Maximum fuel level

4. Install the fuel-tank cap, and wipe up any spilled gasoline.

## Starting the Engine

1. Ensure that the spark-plug wire is connected to the spark plug.
2. Open the fuel valve by turning it in-line with the fuel hose; refer to Fuel Valve (page 8).

3. Move the engine switch to the On position.
4. Move the throttle lever all the way forward to the Choke position; refer to Throttle Lever (page 8).

**Note:** Do not use the choke when the engine is warm.

5. Pull the starter handle lightly until you feel resistance, then pull it sharply. Allow the rope to return to the handle slowly.
6. When the engine starts, move the throttle lever to the Fast position.

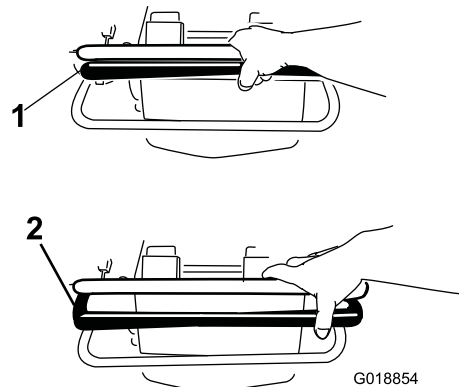
**Note:** The throttle setting governs the maximum drive speed of the machine.

## Stopping the Engine

1. Release the traction-control bail, and allow it to return to the neutral position.
2. Move the engine switch to the Off position to stop the engine.

## Driving the Machine

- To move forward, press the traction-control bail forward (Figure 15). Adjust the speed with the throttle.



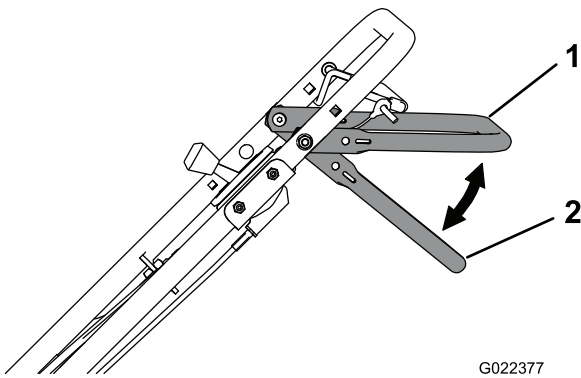
**Figure 15**

1. Forward
2. Neutral (Stop)

- To turn the machine, move slowly and press down on the handle, turn the machine in the desired direction, then resume normal operation.
- To stop, release the traction-control bail (Figure 15).

## Aerating

1. Drive the machine to the desired location, and stop it.
2. Push the tine-control lever down and forward to raise the rear wheels and engage the tines.



**Figure 16**

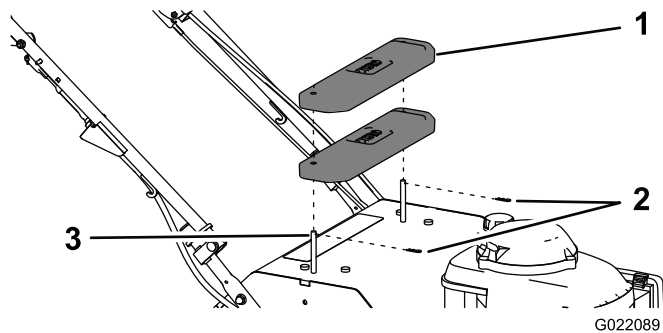
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1. Tine-control lever—disengaged
  2. Tine-control lever—engaged
- 
3. Drive the machine to aerate the desired area.
  4. When finished, stop the machine and pull the tine control lever rearward and up to lower the rear wheels and lifts the tines out of the ground.

**Important:** Do not drive the machine across pavement or other hard surfaces without first raising the tines. Crossing hard surfaces with the tines lowered will damage the tines.

## Adding Weight

To ensure that the tines penetrate fully into the soil, you can add weight to the top of the machine. The machine is shipped with 2 weights and has 2 posts that hold the weights.



**Figure 17**

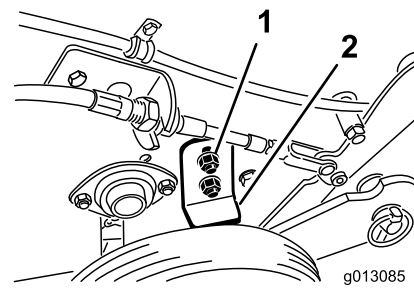
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1. Weight
2. Hairpin cotters
3. Post

## Adjusting the Coring Depth

A coring depth of 6.35 cm (2-1/2 inches) is recommended, but you can change the depth as follows:

1. Raise the tines, stop the machine, stop the engine, and disconnect the spark-plug wire.
2. Loosen the nuts securing the wheel stop on the right side of the machine (Figure 18).



**Figure 18**

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1. Nuts
  2. Wheel stop
- 
3. Raise the wheel stop to increase the coring depth, and lower it to reduce the depth, as required.
  4. Tighten the nuts securely to lock the wheel stop in place.
  5. Repeat steps 2 through 4 for the wheel stop on the left side of the machine. Set the wheel stops to the same height on each side.

## Securing the Machine for Transport

When transporting the machine on a trailer, always use the following procedure:

**Important:** Do not operate or drive the machine on roadways.

1. Drive the machine onto the trailer, stop the machine, stop the engine, turn off the fuel valve, and disconnect the spark-plug wire.

**Important:** If you do not turn off the fuel valve, the engine may flood during transport.

2. Secure the machine to the trailer with chains or straps, using the tie-down/lift loops (Figure 5).

## Operating Tips

- For best performance and maximum tine penetration, water the turf thoroughly the day before aerating.
- Clean the area of debris before using the machine.
- Mark and avoid shallow obstacles such as sprinkler heads and invisible-fence wires.

# Maintenance

## Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first 8 hours	<ul style="list-style-type: none"> <li>• Change the engine oil.</li> </ul>
After the first 10 hours	<ul style="list-style-type: none"> <li>• Check the tension of the drive chain.</li> </ul>
After the first 25 hours	<ul style="list-style-type: none"> <li>• Check the tension of the transmission drive belts.</li> </ul>
Before each use or daily	<ul style="list-style-type: none"> <li>• Check the engine oil level.</li> <li>• Check the tire pressure.</li> <li>• Check the condition of the coring tines and replace any that are damaged or excessively worn.</li> <li>• Check for loose fasteners.</li> </ul>
Every 25 hours	<ul style="list-style-type: none"> <li>• Lubricate and check the drive chain.</li> <li>• Clean the foam pre-cleaner (more frequently in dusty conditions).</li> </ul>
Every 50 hours	<ul style="list-style-type: none"> <li>• Change the engine oil.</li> <li>• Check the tension of the drive chain.</li> <li>• Check the tension of the transmission drive belts.</li> </ul>
Every 100 hours	<ul style="list-style-type: none"> <li>• Inspect and adjust the spark plug; replace it if necessary.</li> </ul>
Every 200 hours	<ul style="list-style-type: none"> <li>• Replace the spark plug.</li> </ul>
Yearly	<ul style="list-style-type: none"> <li>• Replace the paper air filter (more frequently in dusty conditions).</li> </ul>
Yearly or before storage	<ul style="list-style-type: none"> <li>• Touch up chipped paint</li> </ul>

## Premaintenance Procedures

### Disconnecting the Spark-plug Wire

#### ⚠ CAUTION

If you leave the spark-plug wire connected, someone could accidentally start the engine and seriously injure you or other bystanders.

Before performing any maintenance, park the machine on a level surface, stop the engine, and disconnect the spark-plug wire. Set the wire aside so that it does not accidentally contact the spark plug.

Pull the spark-plug wire off the terminal of the spark plug (Figure 19).

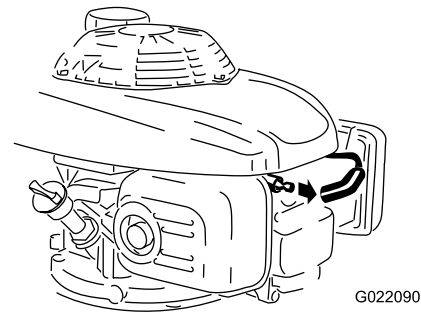


Figure 19

### Accessing the Tines

You can access the tines through the opening on the rear of the machine.

# Lubrication

## Lubricating the Drive Chain

**Service Interval:** Every 25 hours

1. Raise the tines, stop the machine, stop the engine, and disconnect the spark-plug wire.
2. Raise the front of the machine to gain access to the chain, and block it in place; refer to Tipping the Machine (page 14).

### ⚠ CAUTION

If you do not securely block up the front of the machine, the machine could fall on you during service, injuring you.

Ensure that you place a jack stand or block under the front of the machine to hold it up securely.

**Important:** Do not raise the rear of the machine. Raising the rear of the machine will cause the engine to flood and the air cleaner to be fouled with gasoline.

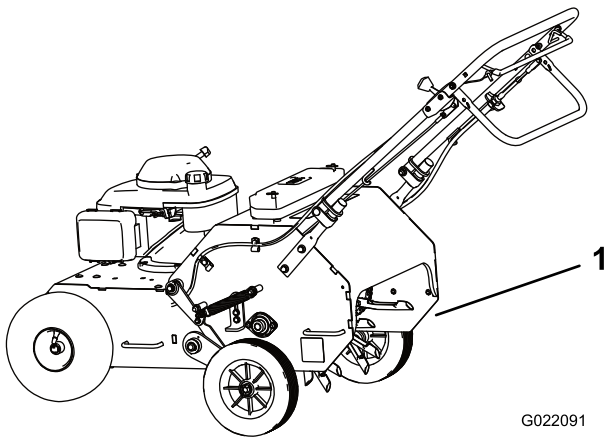


Figure 20

1. Rear opening

## Tipping the Machine

If you need to work on the underside of the machine, you can tip it back and raise the front. Do not tip the machine forward, or you will foul the air cleaner with gasoline. Secure the machine with a jack stand before working under it (Figure 21).

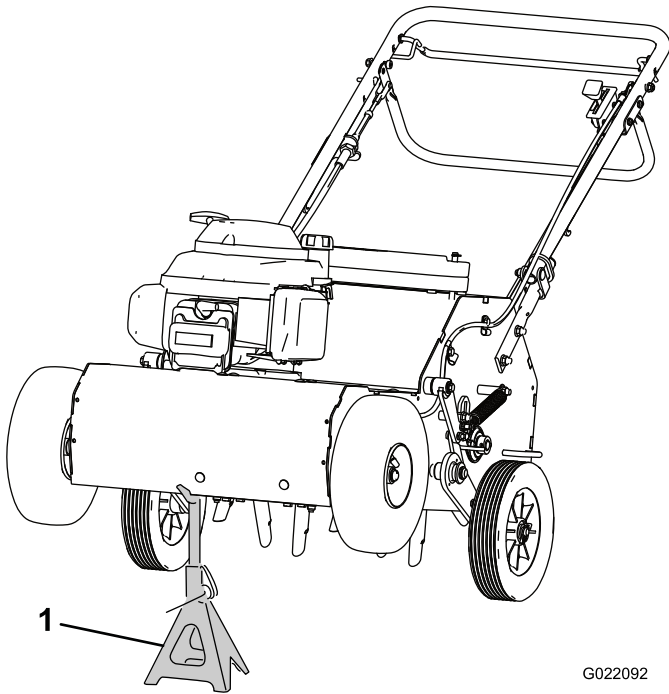


Figure 21

1. Jack stand

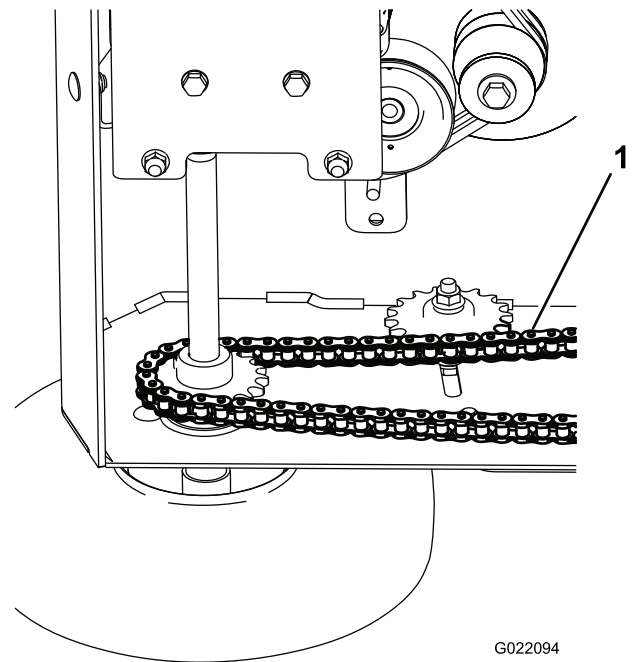


Figure 22

1. Chain

### ⚠ WARNING

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

Use jack stands when supporting the machine.

3. Apply a general-purpose oil (10W-30) onto the lower chain span while rotating the front wheel to expose un-oiled chain links, until the whole chain is oiled.
4. Wipe up any spilled oil, and lower the machine to the ground when you are finished.

## Greasing the Machine

Use a grease gun to lubricate the grease fittings on the front axle with general-purpose lithium grease (Figure 23).

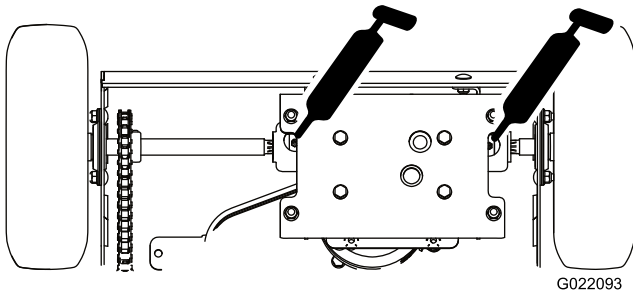


Figure 23

## Engine Maintenance

### Servicing the Air Cleaner

**Service Interval:** Every 25 hours—Clean the foam pre-cleaner (more frequently in dusty conditions).

Yearly—Replace the paper air filter (more frequently in dusty conditions).

**Important:** Do not operate the engine without the air filter assembly; extreme engine damage may occur.

1. Stop the engine and wait for all moving parts to stop.
2. Disconnect the wire from the spark plug.
3. Wipe dirt from the base and the cover with a moist rag.

**Note:** Be careful to prevent dirt and debris from entering the air duct leading to the carburetor.

4. Remove the cover, and remove the foam pre-cleaner from the cover (Figure 24).

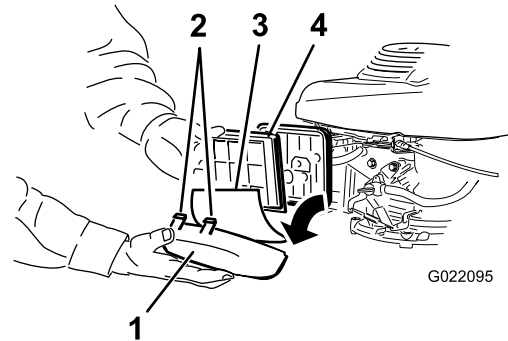


Figure 24

- |               |                                 |
|---------------|---------------------------------|
| 1. Cover      | 3. Foam pre-cleaner             |
| 2. Latch tabs | 4. Paper filter and screen grid |

5. Wash the foam pre-cleaner with a mild detergent and water, then blot it dry.
6. Remove and inspect the paper filter (Figure 24).
  - If it is dirty, tap it on a hard surface several times to remove the dirt.
  - If it is excessively dirty, damaged, or wet with oil or fuel, replace it.

**Important:** Do not try to clean a paper filter.

7. Install the foam pre-cleaner into the air-cleaner cover (Figure 24).
8. Set the paper filter and screen grid in the air-cleaner body, and install the air-cleaner cover

**Note:** Use a new paper filter if you discarded the old one.

## Changing the Engine Oil

**Service Interval:** After the first 8 hours

Every 50 hours

**Note:** Toro Premium Engine Oil is available from your Authorized Toro Dealer.

**Important:** Use 4-cycle engine oil that meets or exceeds the requirements for API service category SJ, SL, SM, or higher.

**Crankcase Capacity:** 0.55 L (18.6 fl oz)

**Viscosity:** Refer to Figure 25.

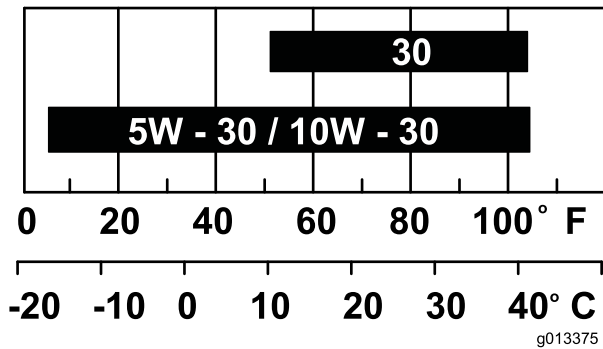


Figure 25

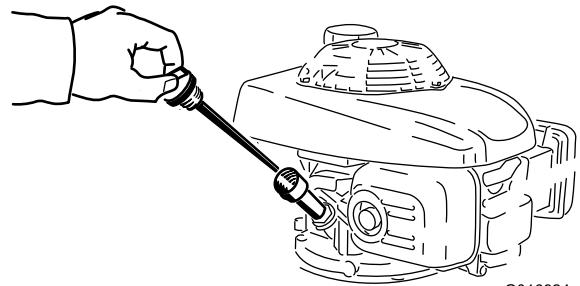


Figure 26

6. Tip the machine to the side, with the air filter up, to drain the used oil out through the oil-fill tube (Figure 27).

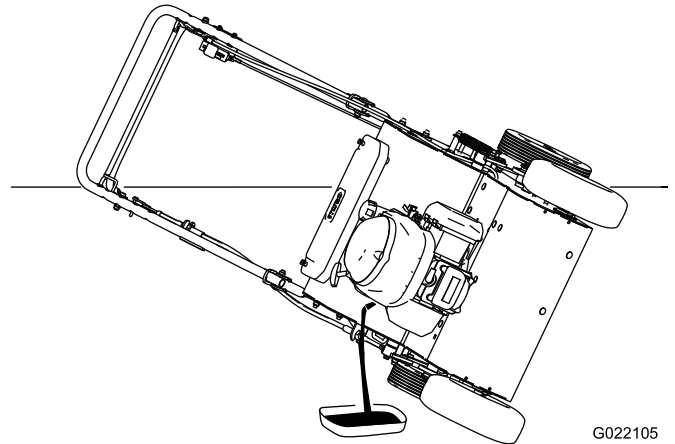


Figure 27

1. Run the engine to warm the engine oil.

**Note:** Warm oil flows better and carries more contaminants.

### **⚠ WARNING**

**Oil may be hot after engine has been run, and contact with hot oil can cause severe personal injury.**

**Avoid contacting the hot engine oil when you drain it.**

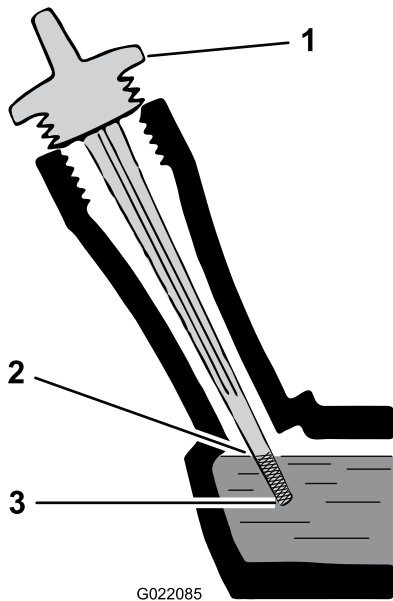
2. Stop the engine and wait for all moving parts to stop.
3. Disconnect the wire from the spark plug.
4. Place a drain pan on the ground to the right of the machine.
5. Remove the dipstick (Figure 26).

7. Tip the machine upright, and clean any spilled oil from the machine.
8. **Slowly** pour oil into the oil fill tube, periodically checking the level with the dipstick, until the dipstick indicates that the engine is full (Figure 28). **Do not overfill.**

**Note:** Allow the oil to settle before checking the oil level again. To check the oil level, insert the dipstick into the filler neck, but **do not rotate the cap clockwise to secure it.**

**Important:** Do not overfill the crankcase with oil and run the engine; engine damage will result. Drain the excess oil until the oil level reaches the upper-limit mark on the dipstick.





**Figure 28**

- 1. Dipstick
- 2. Upper-limit mark
- 3. Lower-limit mark

- 
- 9. Install the dipstick securely.
  - 10. Recycle the used oil according to local codes.

## Servicing the Spark Plug

**Service Interval:** Every 100 hours—Inspect and adjust the spark plug; replace it if necessary.

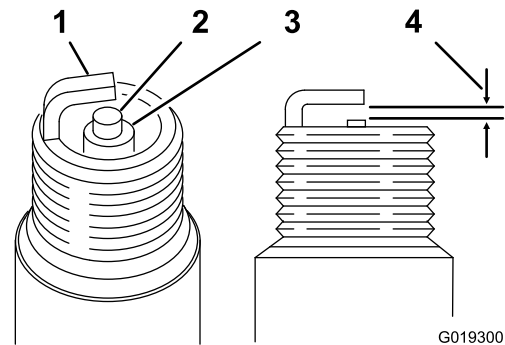
Every 200 hours—Replace the spark plug.

Use an **NGK BPR5ES** spark plug or equivalent.

1. Stop the engine and wait for all moving parts to stop.
2. Disconnect the wire from the spark plug.
3. Clean around the spark plug.
4. Remove the spark plug from the cylinder head.

**Important:** Replace a cracked, fouled, or dirty spark plug. Do not clean the electrodes, because grit entering the cylinder can damage the engine.

5. Set the gap on the plug to 0.7 to 0.8 mm (0.028 to 0.031 inch); refer to Figure 29.



**Figure 29**

- 1. Side electrode
- 2. Center electrode
- 3. Insulator
- 4. 0.7 to 0.8 mm (0.028 to 0.031 inch) gap

- 
6. Carefully install the spark plug by hand (to avoid cross threading) until it is hand tight.
  7. Tighten the spark plug an additional 1/2 turn if it is new; otherwise, tighten it an additional 1/8 to 1/4 turn.

**Important:** A loose spark plug can become very hot and can damage the engine; overtightening a spark plug may damage the threads in the cylinder head.

8. Connect the wire to the spark plug.

# Drive System Maintenance

## Checking the Tire Pressure

**Service Interval:** Before each use or daily

Maintain the air pressure in the tires as specified. Check the tires when they are cold, to get the most accurate reading.

**Pressure:** 138 kPa (20 psi)

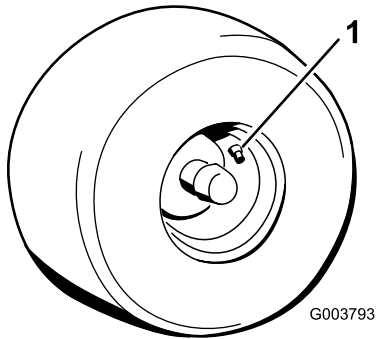


Figure 30

1. Valve stem

## Checking the Tension of Aerator Drive Chain

**Service Interval:** After the first 10 hours

Every 50 hours

1. Raise the tines, stop the machine, stop the engine, and disconnect the spark-plug wire.
2. Raise the front of the machine to gain access to the chain, and block it in place.

### ⚠ CAUTION

If you do not securely block up the front of the machine, the machine could fall on you during service, injuring you.

Ensure that you place a jack stand or block under the front of the machine to hold it up securely.

**Important:** Do not raise the rear of the machine. Raising the rear of the machine will cause the engine to flood and the air cleaner to be fouled with gasoline.

3. Pull down on the chain near the opening in the frame with 4.5 kg (10 lb) of force (Figure 31). If the chain deflects more than 6 mm (1/4 inch), tighten it as follows:

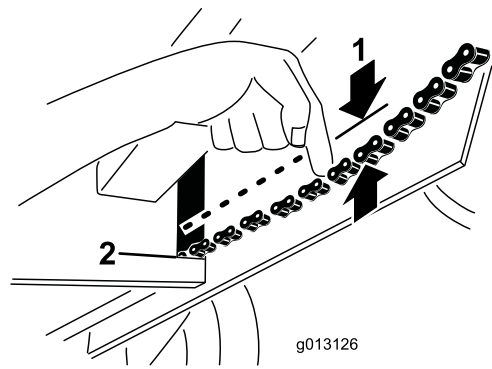


Figure 31

1. Flex in the chain
2. Bottom of the frame opening

- A. Loosen the nut securing the idler sprocket of the chain (Figure 32).

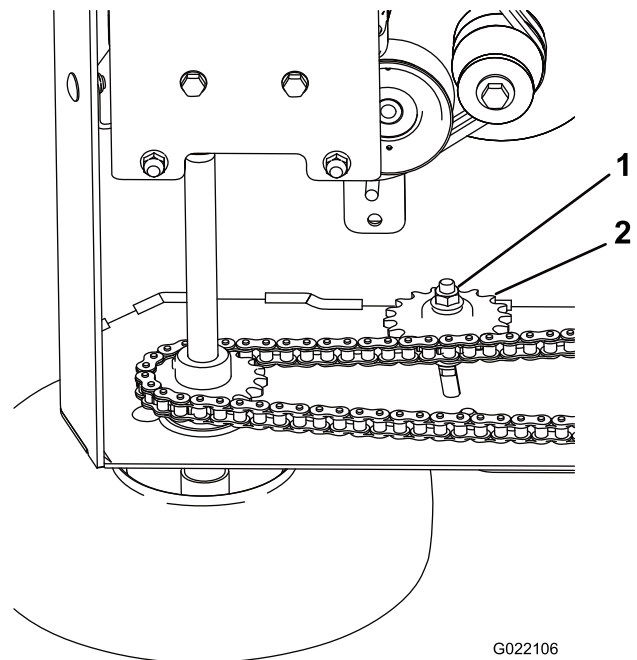


Figure 32

1. Nut
2. Idler sprocket

- B. Pull down on the idler sprocket until the slack is taken out of the chain and there is no more than 6 mm (1/4 inch) of deflection when you apply 4.5 kg (10 pounds) of force to the chain.

**Important:** Ensure that the chain does not come into contact with the frame at the frame opening.

- C. Tighten the idler sprocket nut and torque it to 40.6 N-m (30 ft-lb).

# Belt Maintenance

## Checking and Adjusting the Belt Tension

**Service Interval:** After the first 25 hours

Every 50 hours

1. Raise the tines, stop the machine, stop the engine, and disconnect the spark-plug wire.
2. Raise the front of the machine to gain access to the drive belts, and block it in place; refer to Tipping the Machine (page 14).

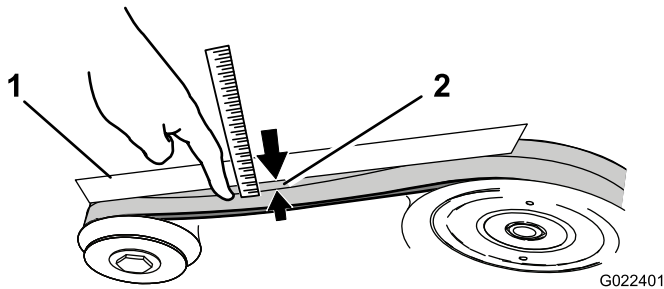
### ⚠ CAUTION

If you do not securely block up the front of the machine, the machine could fall on you during service, injuring you.

Ensure that you place a jack stand or block under the front of the machine to hold it up securely.

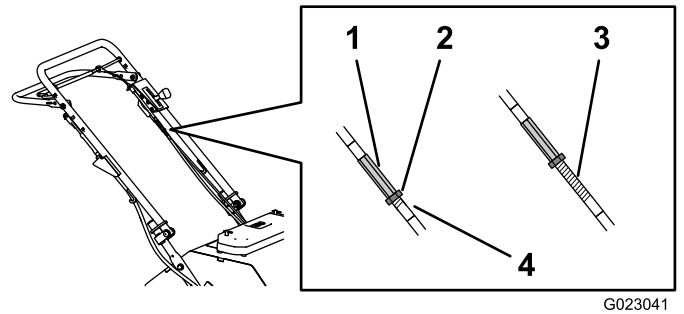
**Important:** Do not raise the rear of the machine. Raising the rear of the machine will cause the engine to flood and the air cleaner to be fouled with gasoline.

3. Push on a span of the drive belts (Figure 33) with 4.5 kg (10 lb) of force. If the belts flex more than 6 to 13 mm (1/4 to 1/2 inch), adjust the tension as follows:



**Figure 33**

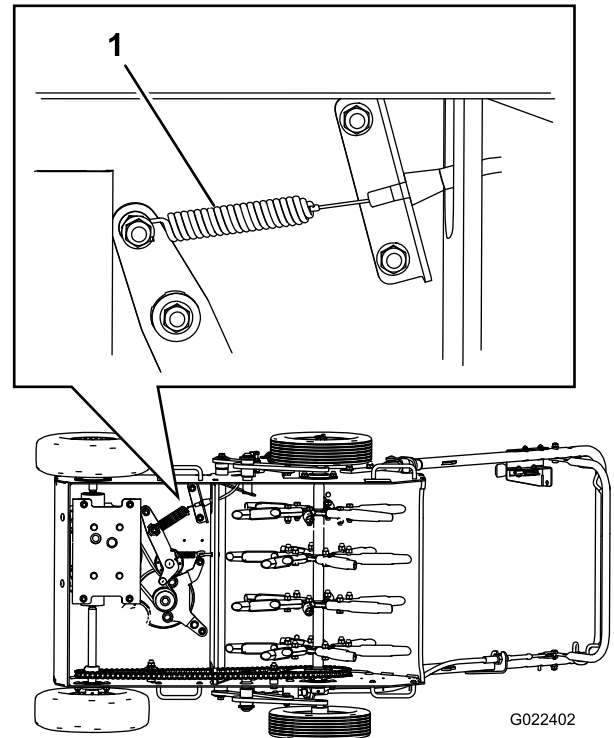
1. Straightedge
2. 6 to 13 mm (1/4 to 1/2 inch)



**Figure 34**

1. Cable fitting
2. Jam nut
3. Increased tension (more threads exposed)
4. Decreased tension (fewer threads exposed)

- B. Adjust the cable fitting (Figure 34) 3 mm (1/8 inch) at a time until the traction-cable spring (Figure 35) is stretched about 10 mm (3/8 inch) from the original (unstretched) position.



**Figure 35**

1. Traction-cable spring

- A. Loosen the jam nut (Figure 34) on the traction cable.

To increase the belt tension, turn the cable fitting counterclockwise, so that **more** threads are exposed. To decrease the belt tension, turn the cable fitting clockwise, so that **fewer** threads are exposed (Figure 34).

- C. Tighten the jam nut to secure the cable fitting.

# Tine Maintenance

## Checking and Replacing the Tines

**Service Interval:** Before each use or daily

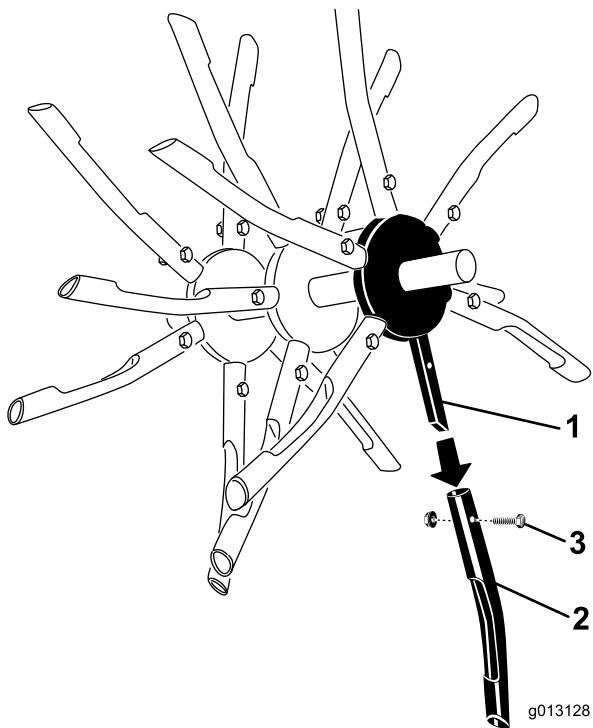
1. Raise the tines, stop the machine, stop the engine, and disconnect the spark-plug wire.
2. Raise the front of the machine so that the front wheels can move freely, and block it in place; refer to Tipping the Machine (page 14).

### ⚠ CAUTION

If you do not securely block up the front of the machine, the machine could fall on you during service, injuring you.

Ensure that you place a jack stand or block under the front of the machine to hold it up securely.

3. Rotate the axle shaft and inspect the tines for wear or damage.
4. If any tines are damaged or broken, remove the nut and bolt securing the tine to the tine assembly (Figure 36).



**Figure 36**

- |                  |                 |
|------------------|-----------------|
| 1. Tine assembly | 3. Bolt and nut |
| 2. Tine          |                 |

5. Remove the tine and replace it with a new one. Ensure that the new tine is facing the same direction as the other tines on the assembly.

6. Secure the new tine with the bolt and nut you removed previously and torque them to 40.6 N-m (30 ft-lb).
7. When all tines have been inspected and replaced as needed, lower the machine to the ground.

# Storage

1. Raise the tines, stop the machine, stop the engine, and disconnect the spark-plug wire.
2. Remove dirt and grime from the entire machine.

**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 engine and transmission.

3. Drain the fuel tank as follows:
  - A. Run the machine until the engine stops from running out of fuel.
  - B. Prime the engine and start it again.
  - C. Allow the engine to run until it stops. When you can no longer start the engine, it is sufficiently dry.
4. Service the air cleaner; refer to Servicing the Air Cleaner (page 15).
5. Lubricate the chain and axle; refer to Lubrication (page 14).
6. Change the engine oil; refer to Changing the Engine Oil (page 16).
7. Check and tighten all bolts, nuts, and screws. Repair or replace any part that is damaged.
8. Paint all scratched or bare metal surfaces. Paint is available from your Authorized Service Dealer.
9. Store the machine in a clean, dry garage or storage area.
10. Cover the machine to protect it and keep it clean.

## Removing the Machine from Storage

1. Check and tighten all fasteners.
2. Inspect the spark plug and replace it if it is dirty, worn, or cracked; refer to the engine *Operator's Manual*.
3. Install the spark plug until it is hand-tight, then an additional 1/2 turn if it is new, otherwise, tighten it an additional 1/8 to 1/4 turn.
4. Perform any needed maintenance procedures; refer to Maintenance (page 13).
5. Check the engine oil level; refer to ? Checking the Engine Oil Level (page 7).
6. Fill the fuel tank with fresh gasoline; refer to Filling the Fuel Tank (page 10).
7. Connect the wire to the spark plug.

# Troubleshooting

Problem	Possible Cause	Corrective Action
The engine will not start.	<ol style="list-style-type: none"> <li>1. The engine switch is in the Off position.</li> <li>2. The throttle lever is in the Off position.</li> <li>3. The spark-plug wire is disconnected.</li> <li>4. The fuel valve is turned off.</li> <li>5. The traction lever is not in the neutral position.</li> <li>6. The engine brake-bypass lever has come off.</li> </ol>	<ol style="list-style-type: none"> <li>1. Move the switch to the On position.</li> <li>2. Move the throttle lever to the Choke position.</li> <li>3. Connect the spark-plug wire.</li> <li>4. Open the fuel valve.</li> <li>5. Release the traction lever so that it returns to the neutral position.</li> <li>6. Install the brake-bypass lever.</li> </ol>
The machine vibrates abnormally.	<ol style="list-style-type: none"> <li>1. There are loose bolts and/or broken parts.</li> </ol>	<ol style="list-style-type: none"> <li>1. Stop the machine and the engine immediately. Tighten any loose bolts, and replace any broken or missing parts.</li> </ol>
The machine will not drive up hills.	<ol style="list-style-type: none"> <li>1. The drive belt to the transmission is loose.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check and tighten the transmission drive belt.</li> </ol>
The front wheels move but the tines do not.	<ol style="list-style-type: none"> <li>1. The chain or a drive sprocket is broken.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace the broken chain or sprocket.</li> </ol>
The engine smokes when starting.	<ol style="list-style-type: none"> <li>1. The engine was tipped forward.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check the air filter and replace it if it is fouled. Always tip the machine back when servicing.</li> </ol>
The engine is hard to start after transporting the machine.	<ol style="list-style-type: none"> <li>1. The fuel valve was not closed before transport, and the engine is flooded.</li> </ol>	<ol style="list-style-type: none"> <li>1. Always close the fuel valve before transporting the machine.</li> </ol>

**Notes:**



# The Toro Warranty

SWS  
Turf Renovation  
and  
Tree Care

A limited warranty (see warranty periods below)

## Conditions and Products Covered

The Toro Company and its affiliate, Toro Warranty Company, pursuant to an agreement between them, jointly warrant your Toro Products listed below to be free from defects in materials or workmanship.

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

The following time periods apply from the date of purchase:

Products	Warranty Period
Turf Renovation	
Walk-Behind Aerator	1 year
• Engine	2 years
Stand-On Aerator	1 year
• Battery	90 days Parts and Labor
	1 year Parts Only
• Engine	2 years
Dethatcher	1 year
• Engine	2 years
Turf Seeder	1 year
• Engine	2 years
Tree Care	
Log Splitter	1 year
• Battery	90 days Parts and Labor
	1 year Parts Only
• Engine	2 years
Stump Grinder	1 year
• Engine	2 years
Brush Chipper	1 year
• Battery	90 days Parts and Labor
	1 year Parts Only
• Engine	3 years

Where a warrantable condition exists, we will repair the Product at no cost to you including diagnosis, labor, and parts.

## 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 Servicing Outlet to arrange service at their dealership. To locate one convenient to you, access our website at [www.Toro.com](http://www.Toro.com). Select "Where to Buy" and select "Contractor" under product type. You may also call our toll free number below.
2. Bring the product and your proof of purchase (sales receipt) to them.
3. If for any reason you are dissatisfied with the Service Outlet's analysis or with the assistance provided, contact us at:

SWS Customer Care Department  
Toro Warranty Company  
8111 Lyndale Avenue South  
Bloomington, MN 55420-1196  
Toll Free: 888-384-9940

\*\*Toro Authorized Rental Customers who have purchased products directly from Toro and have signed the Toro Rental Customer Agreement have the ability to perform their own warranty work. Please visit Toro's Rental Portal for electronic warranty claim filing procedures or call the toll free number above.

## 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. Parts scheduled for replacement as required maintenance ("Maintenance Parts"), are warranted for the period of time up to the scheduled replacement time for that part. Failure to perform required maintenance and adjustments can be grounds for disallowing a warranty claim.

## Items and Conditions Not Covered

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

- Product failures which result from the use of non-Toro replacement parts, or from installation and use of add-on, modified, or unapproved accessories
- Product failures which result from failure to perform required maintenance and/or adjustments
- Product failures which result from operating the product in an abusive, negligent or reckless manner
- Parts subject to consumption through use unless found to be defective. Examples of parts which are consumed, or used up, during normal product operation include, but are not limited to, belts, cutters, blades, teeth, spark plugs, tires, filters, etc.
- Failures caused by outside influence. Items considered to be outside influence include, but are not limited to, weather, storage practices, contamination, use of unapproved coolants, lubricants, additives, or chemicals, etc.
- Normal "wear and tear" items. Normal "wear and tear" includes, but is not limited to, worn painted surfaces, scratched decals, etc.
- Any component covered by a separate manufacturer's warranty
- Pickup and delivery charges

## General Conditions

Repair by an Authorized Servicing Outlet or Self-Service as an Authorized Rental Customer is your sole remedy under the warranty.

**Neither The Toro Company nor Toro Warranty Company is liable for indirect, incidental or consequential damages in connection with the use of the Toro Products covered by this warranty, including any cost or expense of providing substitute equipment or service during reasonable periods of malfunction or non-use pending completion of repairs under this warranty. All implied warranties of merchantability and fitness for use are limited to the duration of this express warranty. Some states do not allow exclusions of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above exclusions and limitations may not apply to you.**

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

Except for the engine warranty coverage and the Emissions warranty referenced below, if applicable, there is no other express warranty. The Emissions Control System on your Product may be covered by a separate warranty meeting requirements established by the U.S. Environmental Protection Agency (EPA) or the California Air Resources Board (CARB). Refer to the California Emission Control Warranty Statement supplied with your Product or contained in the engine manufacturer's documentation for details.

## Countries Other than the United States or Canada

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

**Australian Consumer Law:** Australian customers will find details relating to the Australian Consumer Law either inside the box or at your local Toro Dealer.