Form No. 3374-363 Rev A

TORO®

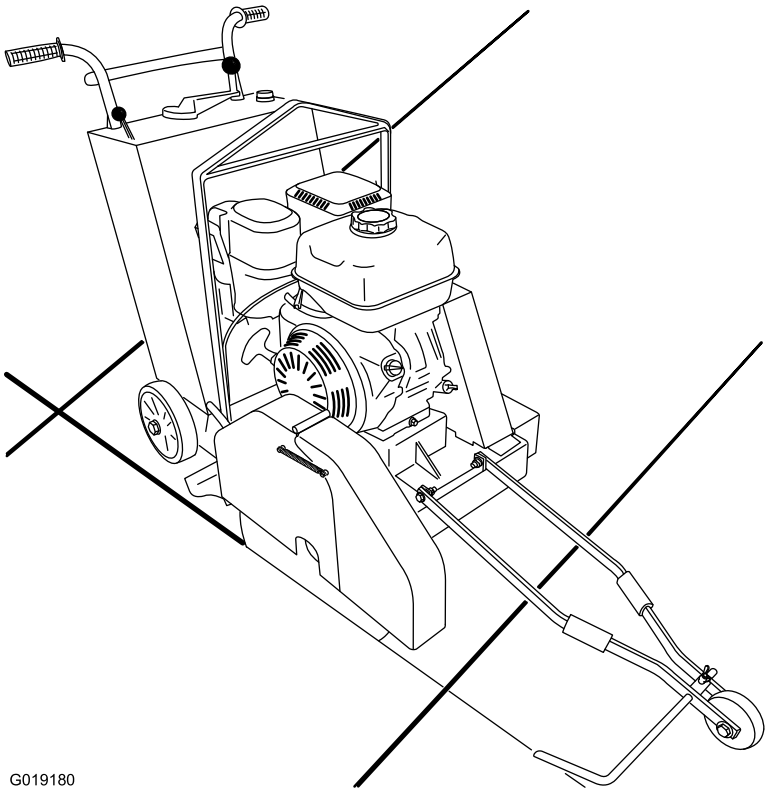
Count on it.

Operator's Manual

CS-1 and CS-2 Concrete Saw

Model No. 68045—Serial No. 313000001 and Up

Model No. 68046—Serial No. 313000001 and Up



G019180

Register at www.Toro.com.
Original Instructions (EN)

3374-363 A

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.

Use of this product may cause exposure to chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

⚠ DANGER

There may be buried power, gas, and/or telephone lines in the work area. Shock or explosion may occur if you cut into them.

Have the property or work area marked for buried lines and do not dig in marked areas. Contact your local marking service or utility company to have the property marked (for example, in the United States, call 811 for the nationwide marking service).

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 incorporated with the muffler assembly.

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

Important: This engine is 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 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 machine is designed to flat saw asphalt and concrete. It is not intended to cut wood any other material other than asphalt and concrete.

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

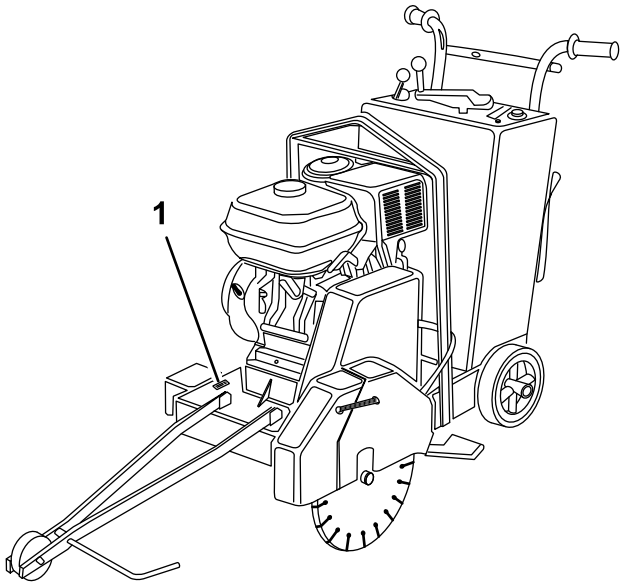


Figure 1

1. Model and serial number plate

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.

8111 Lyndale Avenue South
Bloomington, MN 55420

Figure 2

1. Safety alert symbol

This manual uses 2 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 3
- Safe Operating Practices 3
- Safety and Instructional Decals 5

Product Overview 7
- Controls 8
- Specifications 10
- Attachments/Accessories 10

Operation 11
- Before you Start 11
- Adjusting the Handle Bar (Model 68046) 11
- Removing and Installing the Saw Blade 11
- Adjusting the Cutting Depth 14
- Aligning the Pointer 15
- Adding Fuel 16
- Servicing the Engine Oil 18
- Starting and Stopping the Engine 19
- Cutting the Job-Site Surface 20
- Changing the Cutting Position 22
- Transporting the Machine 25

Maintenance 26
- Recommended Maintenance Schedule(s) 26
- Lubrication 27
  - Greasing the Machine 27
  - Lubricate the Elevation Screw 27
- Engine Maintenance 28
  - Servicing the Air Filter 28
  - Changing the Engine Oil 29
  - Servicing the Fuel System 30
  - Servicing the Spark Plug 31
  - Servicing the Spark Arrester 32
- Belt Maintenance 33
  - Servicing the Drive Belts 33
- Saw Blade Maintenance 38
  - Checking the Condition and Function 38
- Cleaning 40
  - Cleaning the Machine 40

Storage 40
- Storing the Machine 40

Troubleshooting 42

Safety

Improper use or maintenance by the operator or owner can result in injury. To reduce the potential for injury, comply with these safety instructions and 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

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

⚠ WARNING

Engine exhaust contains carbon monoxide, an odorless, deadly poison that can kill you.

Do not run the engine indoors or in an enclosed area.

⚠ WARNING

Machining or handling stone, masonry, concrete, metal, and other materials can generate dust, mists, and fumes containing chemicals, such as silica, known to cause serious or fatal injury or illness, such as respiratory disease, silicosis, cancer, birth defects, or other reproductive harm.

- **Control dust, mist, and fumes at the source where possible. Water should be used for dust suppression when feasible.**
- **Use good work practices and follow the recommendations of the manufacturer or suppliers, OSHA, and other occupational and trade associations.**
- **Always follow respiratory precautions.**
- **When the hazards from inhalation cannot be eliminated, the operator and any bystanders should wear a respirator approved by OSHA for the material being handled.**

Training

- Read the *Operator's Manual* and other training material. If the operator(s) or mechanic(s) cannot 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

- Decide whether wet cutting or dry cutting is performed and evaluate the job site material(s) to determine what blade application is needed to properly and safely perform the job. Only use blades approved for the cutting operation by the manufacturer of the saw blade.
- Wear appropriate clothing including hard hat, face shield, safety glasses, long pants, safety shoes, respirator or dust mask, and hearing protection. Long hair, loose clothing, or jewelry may get tangled in moving parts.
- Inspect the job site where the equipment is to be used and remove all objects such as loose site materials, rocks, wood products, tools and hardware 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 to store and transport fuel.
  - Never remove the gas cap or add fuel with the engine running. Allow the engine to cool before refueling. Do not smoke while fueling the machine.
  - Never refuel or drain the machine indoors.
- Check that the guards 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.
- Ensure that the blade is elevated above the job-site surface before starting the engine. Only start the engine from the operator's position.
- Elevate the blade above the job-site surface after each cutting pass.
- Ensure that the blade is elevated when moving the machine to the job site, from the job site, and to a new cutting path.
- Never operate with the guards not securely in place.
- Do not change the engine governor setting or over-speed the engine.
- Before leaving the operator position for any reason, elevate the blade above the site surface, reduce the throttle to idle, and press the stop switch.
- Keep hands and feet away from the blade.
- Look behind and down before backing up to be sure of a clear path.
- Keep pets and bystanders away.
- Use care moving the machine between job sites. Slow down when and use caution when making turns and when crossing roads and sidewalks.
- Do not operate the machine under the influence of alcohol or drugs.
- Use care when loading or unloading the machine into a trailer or truck.
- Ensure that the area is clear of other people before operating the machine. Stop the machine if anyone enters the area.
- Never leave a running machine unattended. Always elevate the blade, stop the engine and verify the blade has stopped rotating.
- Never jerk the controls; use a steady motion.
- Watch for traffic when operating near or crossing roadways.
- Do not touch parts which may be hot from operation. Allow them to cool before attempting to maintain, adjust, or service.
- Ensure that you operate the machine in areas where there are no obstacles in close proximity to the operator. Failure to maintain adequate distance from trees, walls, and other barriers may result in injury as the machine backs up during operation if the operator is not attentive to the surroundings. Only operate the unit in areas where there is sufficient clearance for the operator to safely maneuver the product.
- Locate the pinch point areas marked on the machine and keep hands and feet away from these areas.
- 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.

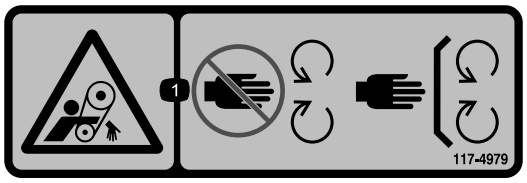
Maintenance and Storage

- Elevate the blade above the job-site surface and stop the engine. Wait for the blade to stop before adjusting, cleaning, or repairing.
- Clean debris from the blade, blade guard, mufflers, and engine to help prevent fires. Clean up oil or fuel spillage.
- Let the engine cool before storing and do not store near flame.
- Do not store fuel near flames or drain indoors.
- Park the machine on level ground. Never allow untrained personnel to service the machine.
- Use jack stands to support components when required.
- Carefully release pressure from components with stored energy.
- 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.
- Keep nuts and bolts tight. Keep equipment in good condition.
- Never tamper with safety devices.
- Keep the machine free of grass, leaves, or other debris buildup. Clean up oil or fuel spillage. Allow the machine to cool before storing.
- Use extra care when handling gasoline and other fuels. They are flammable and vapors are explosive.
  - Use only an approved container to store fuel.
  - Never remove the gas cap or add fuel when the engine is running. Allow the engine to cool before refueling. Do not smoke.
  - Never refuel the machine indoors.
  - Never store the machine or fuel container inside where there is an open flame, such as near a water heater or furnace.
  - Never fill a container while it is inside a vehicle, the cargo box of a truck, or any surface other than the ground.
  - Keep container nozzle in contact with the tank during filling.
- Stop and inspect the equipment if you strike an object. Make any necessary repairs before restarting.
- Use only genuine Toro replacement parts to ensure that original standards are maintained.

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.

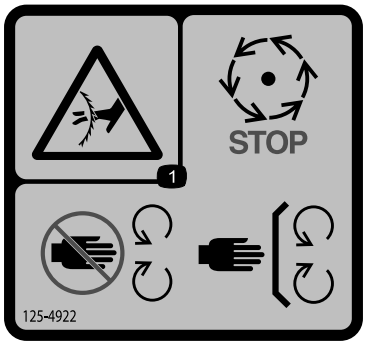


117–4979

1. Rotating belt — Keep guard in place

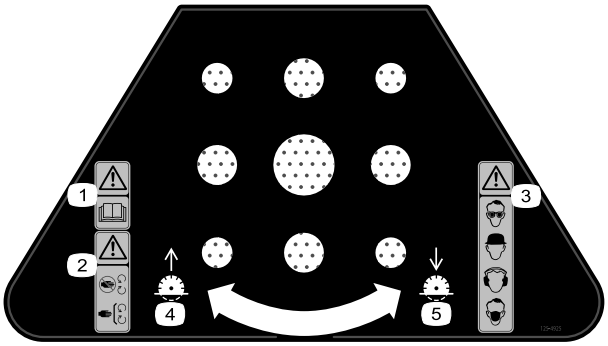
125–4921

1. Warning—read the *Operator's Manual*.
2. Warning—keep hands away from hot surfaces.
3. Entanglement hazard, belt—keep hands away from moving parts; keep all guards in place.



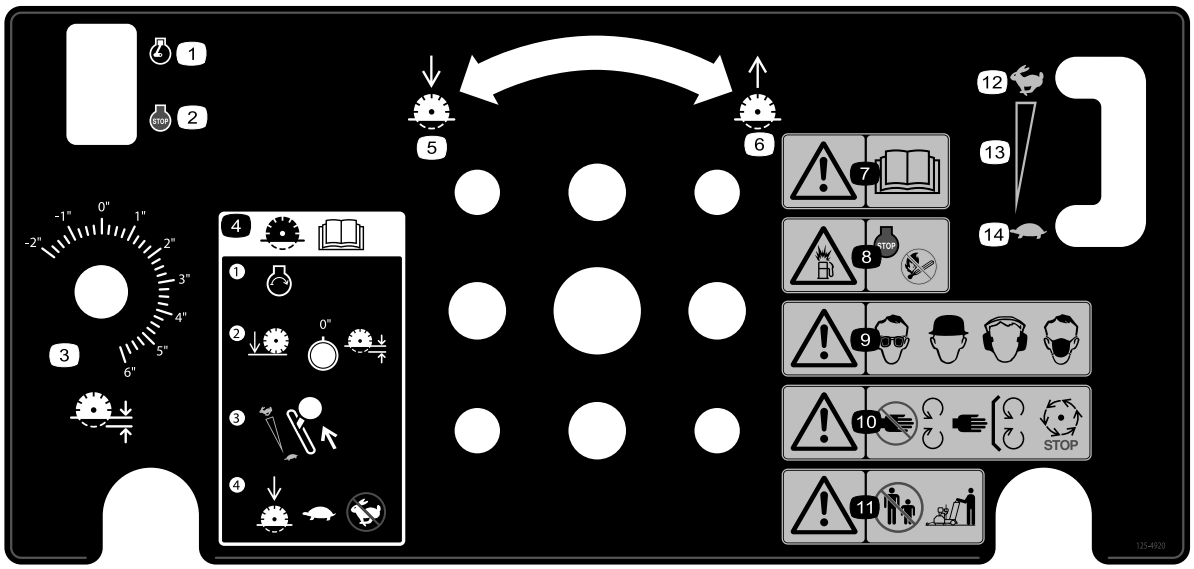
125–4922

1. Cutting/dismemberment hazard of hand, circular blade—stop the blade; keep hands away from moving parts; keep all guards in place.



125–4925

1. Warning—read the *Operator's Manual*.
2. Warning—keep hands away from moving parts; keep all guards in place.
3. Warning—wear eye, head, hearing, and respiratory protection.
4. Raise blade
5. Lower blade



125–4920

1. Engine—run
2. Engine—stop
3. Adjust cutting height
4. Read the *Operator's Manual*—1)Start the engine; 2)Set the blade height to 0 inches; 3)Set the blade speed to fast; 4)When lowering the blade for cutting, set the speed to slow.
5. Lower the blade
6. Raise the blade
7. Warning—read the *Operator's Manual*.
8. Explosion hazard, fueling—stop the engine and keep flames away when fueling.
9. Warning—wear eye, head, hearing, and respiratory protection.
10. Warning—keep away from moving parts; keep all guards in place; wait for moving parts to stop.
11. Warning—keep bystanders away from the machine.
12. Fast
13. Variable speed
14. Slow

Product Overview

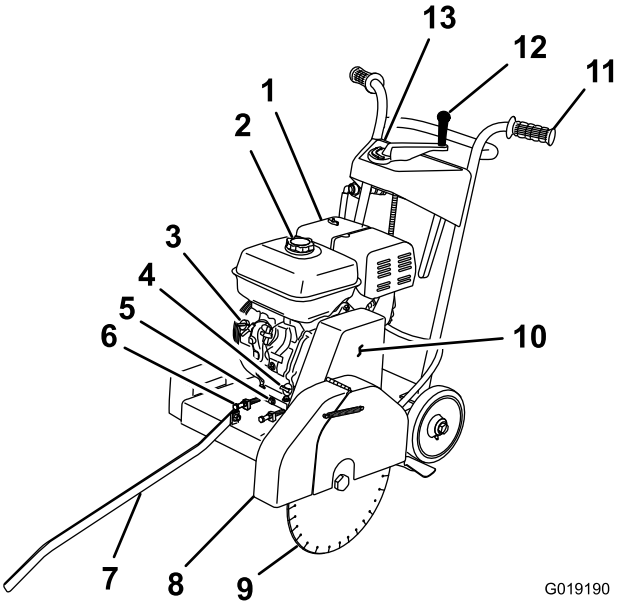


Figure 3

Overview (Model 68045)

1. Air filter cover
2. Fuel tank cap
3. Engine switch
4. Oil filler cap/dipstick
5. Oil drain bolt
6. Belt tension bolt
7. Forward pointer
8. Blade guard
9. Saw blade
10. Belt guard
11. Handle bar
12. Elevation crank
13. Operator panel

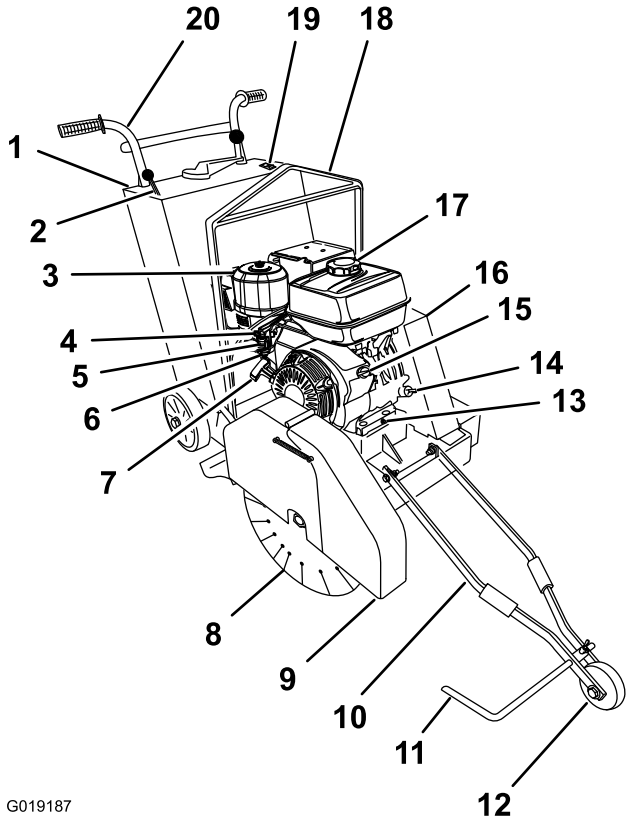


Figure 4

Overview (Model 68046)

1. Operator panel
2. Throttle lever
3. Air filter cover
4. Choke lever
5. Fuel valve lever
6. Sediment cup
7. Recoil start handle
8. Saw blade
9. Blade guard
10. Pointer fork
11. Forward pointer
12. Pointer wheel
13. Oil drain bolt
14. Oil filler cap/dipstick
15. Engine switch (engine location)
16. Belt guard
17. Fuel tank cap
18. Lifting bale
19. Engine switch (operator panel location)
20. Handle bar

Controls

Become familiar with all the controls (Figure 5, Figure 6, and Figure 7) before you start the engine and operate the machine.

Operator Panel (Model 68045)

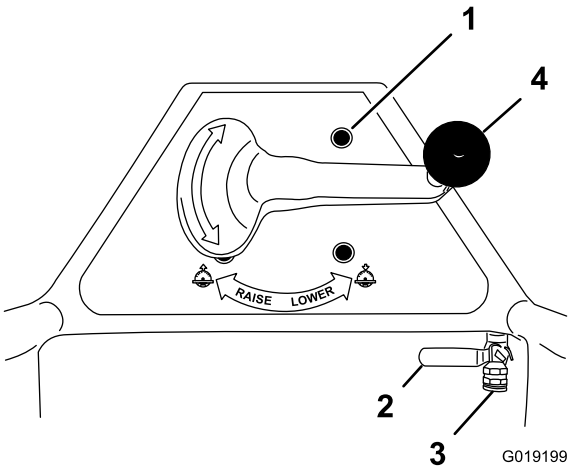


Figure 5

Operator Panel (Model 68045)

1. Index hole
2. Water valve handle
3. Water connector
4. Elevation crank

Operator Panel (Model 68046)

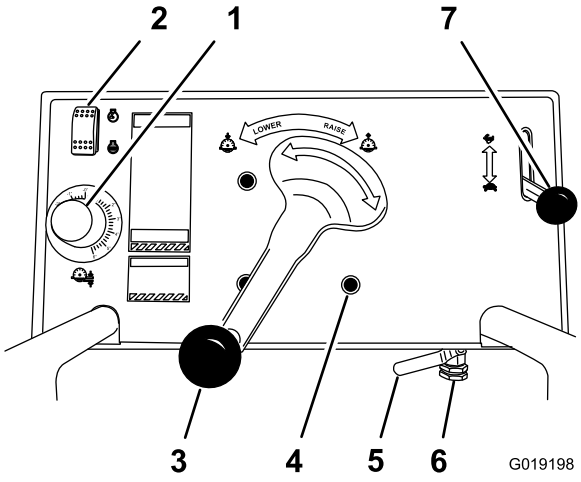


Figure 6

Operator Panel (Model 68046)

1. Blade depth gauge
2. Engine switch
3. Blade elevation crank
4. Index hole
5. Water valve handle
6. Water connector
7. Throttle

Engine Controls

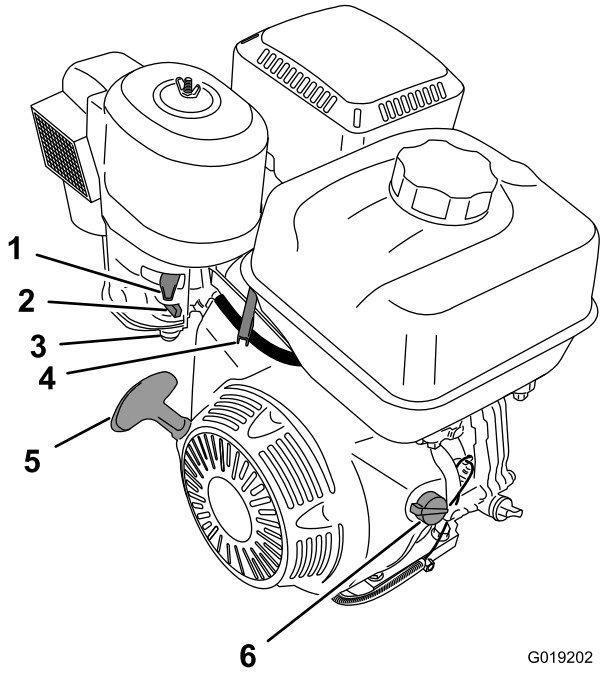


Figure 7

Engine Controls (Models 68045 and 68046)

1. Choke lever
2. Fuel valve lever
3. Sediment cup
4. Throttle lever
5. Recoil start handle
6. Engine switch

Fuel Valve

The fuel valve (Figure 8) is located underneath the choke lever. The lever for the fuel valve must be moved to the On position before attempting to start the engine. Once you have finished using the machine and you have turned the engine off, move the lever for the fuel valve to the Off position.

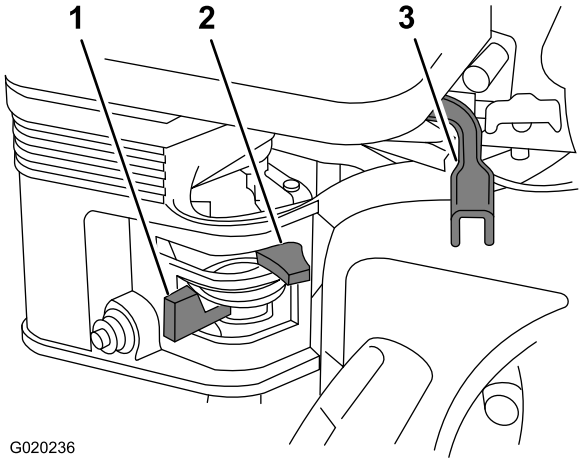


Figure 8

Engine Controls

1. Fuel valve
2. Choke lever
3. Throttle lever

Choke Lever

The choke lever (Figure 8) is required when starting a cold engine. Before pulling on the recoil starter handle, move the choke lever to the closed position. Once the engine is running, move the choke lever to the open position. Do not use the choke if the engine is already warmed up or the air temperature is high.

Throttle Lever (Model 68045)

The throttle lever (Figure 8) controls the speed (RPM) of the engine. It is located next to the choke lever. It sets the engine RPM and therefore can increase and decrease the rotation speed of the saw blade. For best performance it is recommended you set this control to the fast position.

Throttle Control (Model 68046)

Important: Model 68046 only—do not use the throttle lever on the engine. Damage to the throttle linkage may occur to the operator panel throttle control.

The throttle control is located on the operator panel (Figure 9), and controls the speed (RPM) of the engine. It sets the engine RPM and therefore can increase and decrease the rotation speed of the saw blade. For best performance it is recommended you set this control to the fast position.

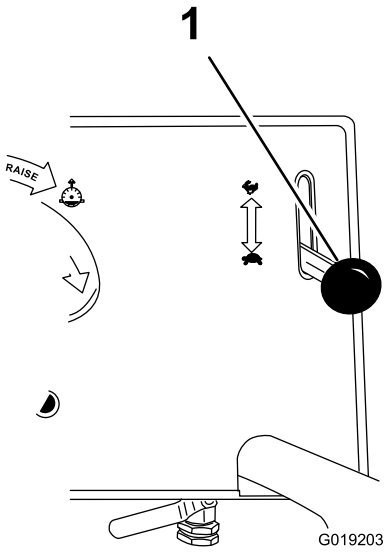


Figure 9

Engine On/Off Switch

The On/Off switch (Figure 10) allows the operator of the machine to start and stop the engine. This switch is located on the front of the engine. It is marked l (ON) and O (OFF). To start the machine, you must first move this control to the On position. When you want to stop the engine, move this switch to the Off position.

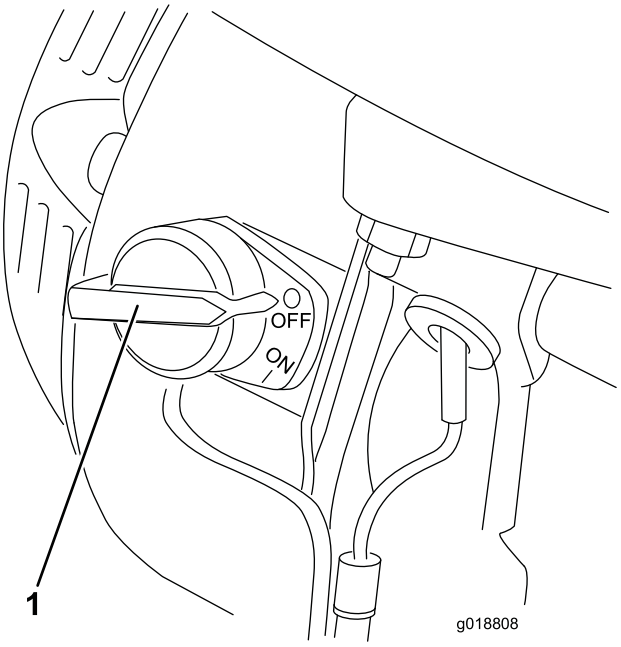


Figure 10

1. Engine On/Off switch

Engine Switch (Model 68046)

The engine switch is located on the operator panel (Figure 11). Use the engine switch to stop the engine during routine machine operation and when shutting the machine Off in an emergency situation.

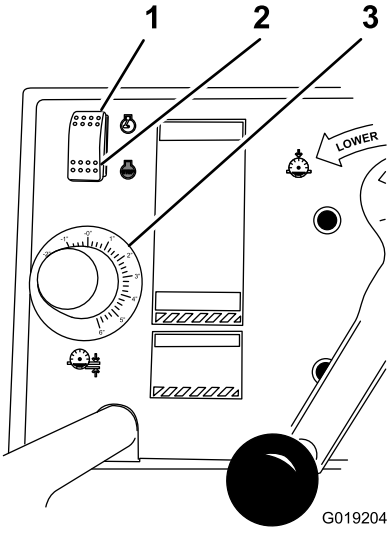


Figure 11

Engine Switch and Blade Depth Gauge (Model 68046)

1. Run engine
2. Stop engine
3. Blade depth gauge

Recoil Starter

To start the engine, pull on the recoil start handle (Figure 7) quickly to turn the engine over. The controls on the engine

described above must all be set correctly for the engine to start.

Oil Alert System

The Oil Alert system is designed to prevent engine damage caused by an insufficient amount of oil in the crankcase. Before the oil level in the crankcase can fall below a safe limit, the Oil Alert system will automatically stop the engine (the engine switch will remain in the ON position). If the engine stops and will not restart, check the engine oil level before troubleshooting in other areas.

Blade Depth Gauge (Model 68046)

The blade depth gauge (Figure 11) is used to indicate the saw blade elevation above the job site surface and blade-cut depth into the job-site surface.

Specifications

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

	Model 68045	**Model 68046**
Length	92.7 cm (36.5 inch) †	120.1 cm (47.3 inch) †
Width	67.5 cm (26.6 inch)	67.6 cm (26.6 inch)
Height	87.4 cm (34.4 inch)	93.3 cm (36.75 inch) ‡
Weight	80 Kg (175 lb)	141 Kg (310 lb)
Arbor Speed (Max.)	55.3 Hz (3200 RPM)	55.3 Hz (3200 RPM)
Arbor Diameter	25.4 mm (1 inch)	25.4 mm (1 inch)
Blade Diameter / Cutting Depth (Max)	356 mm (14 inch) blade / 117 mm (4.63 inch) depth	356 mm (14 inch) blade / 117 mm (4.63 inch) depth 406 mm (16 inch) blade / 143 mm (5.63 inch) depth 457 mm (18 inch) blade / 168 mm (6.63 inch) depth

† Pointer in the up position.
‡ Handles in the mid position.

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.

Operation

Important: Before operating, check the fuel and oil level, and remove debris from the machine. Also, ensure that the area is clear of people and debris. You should also know and have marked the locations of all utility lines.

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

Model 68045: Use for surface sawing asphalt and concrete of smaller jobs such as floor and pavement repair, expansion joint cutting, conduit channel cutting, and other flat work.

Model 68046: Use for surface sawing asphalt and concrete of jobs that require precision cutting including floors, walkways, ramps, and other flat surfaces.

Before you Start

⚠ DANGER

Identify and mark the location and route of water, gas, and electrical lines. Loss of life or damage to property may occur if these utilities are cut.

- Use the correct blade for the material being cut.
- Ensure that the arbor, collars, and arbor nut are undamaged.
- Install the blade with both arbor wrenches.
- When wet cutting, ensure that the water jets produce adequate water flow.
- Align the pointer(s) with the saw blade.
- Remove all equipment and loose debris from the job site cutting path. Remove loose concrete, asphalt, or both from the cutting path.
- Review all the machine's safety decals.
- Wear a hard-hat, respirator or dust mask, hearing protection, and eye protection when operating the machine.
- Ensure that you are familiar with safety regulations and shutdown procedures described in the Operator's Manual.
- Ensure that all guards are in place and in good condition.
- Ensure that the blade is has no damage or unusual wear, and is secure to the arbor.
- Ensure that everyone, including children and animals, maintain a distance of at least 50 feet (15 m) from the machine. Debris can be thrown out and injure people and animals.

Adjusting the Handle Bar (Model 68046)

Raising and Lowering the Handle Bar

1. Locate the bolts that secure the handlebars to the back of the console (Figure 12).

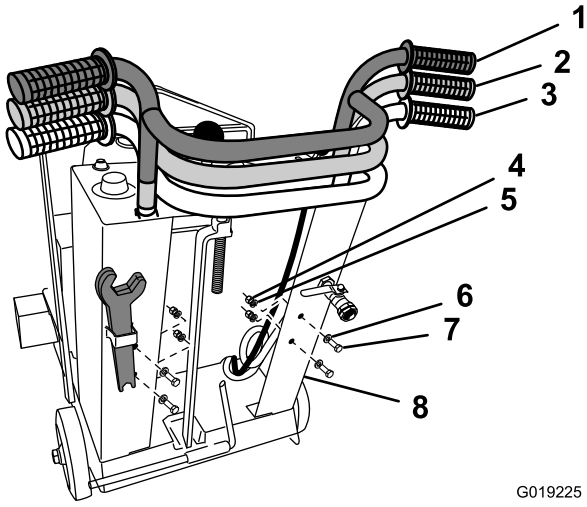


Figure 12
Handle Bar Adjustment (Model 68046)

1. High position	5. Lock washer
2. Middle position	6. Flat washer
3. Low position	7. Bolt
4. Nut	8. Console

2. Remove the bolts, nuts, and washers that secure the handle bar to the console (Figure 12).
3. Raise or lower the handle bar (Figure 12).
4. Align the holes in the handle bar with the mounting holes in the console.
5. Secure the handlebar to the console with the bolts, nuts, and washers removed in step 2 (Figure 12).

Removing and Installing the Saw Blade

Important: Before removing or installing the saw blade, remove the spark plug wire from the spark plug.

Note: Ensure that the following conditions are met when installing the saw blade:

- Ensure that the blade is rated for 3200 RPM or greater before installing it on the machine.
- Check the cooling requirements for the blade and cutting operation.

  Always use water with a wet-cutting diamond blade. A dry-cutting blade can be used with or without water.

- Ensure that the blade specification and size matches the cutting application. Check with the blade manufacturer for the proper application.
- Ensure that the blade is not damaged with any of the following conditions:
  - Worn core
  - Cracked core
  - Missing segments
  - Worn arbor hole
  - Worn drive-pin hole

Removing the Blade

1. Raise the saw blade to the **Start Elevation**; refer to step C in Changing Cut Depth (page 14).
2. Park the machine on a level surface and turn off the engine; refer to Stopping the Engine (page 19).
3. Ensure that the machine surfaces are cool.
4. Disconnect the spark plug (Figure 13).

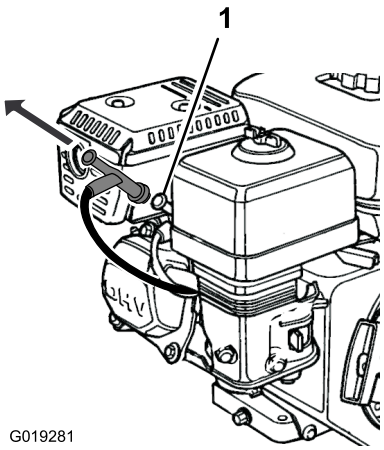


Figure 13
Disabling the Engine

1. Spark plug wire

5. Remove the 2 wrenches from the storage bracket at the back-left side of the operator panel (Figure 14).

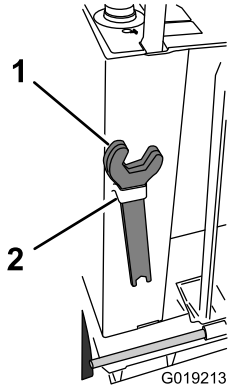


Figure 14
Arbor Wrench Storage

1. Wrenches
2. Storage bracket

6. Rotate the forward section of the blade guard open (Figure 15).

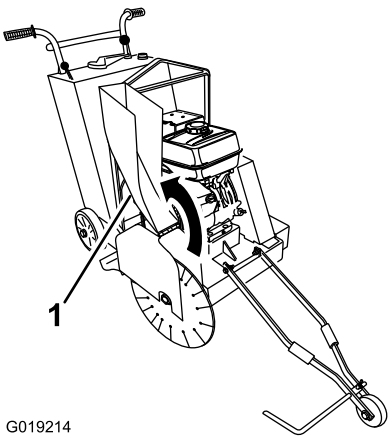


Figure 15
Blade Guard

1. Forward blade guard section

7. Place one wrench on the flats of the inner collar and place the other wrench on the arbor nut. Remove the arbor nut by rotating it counterclockwise (Figure 16).

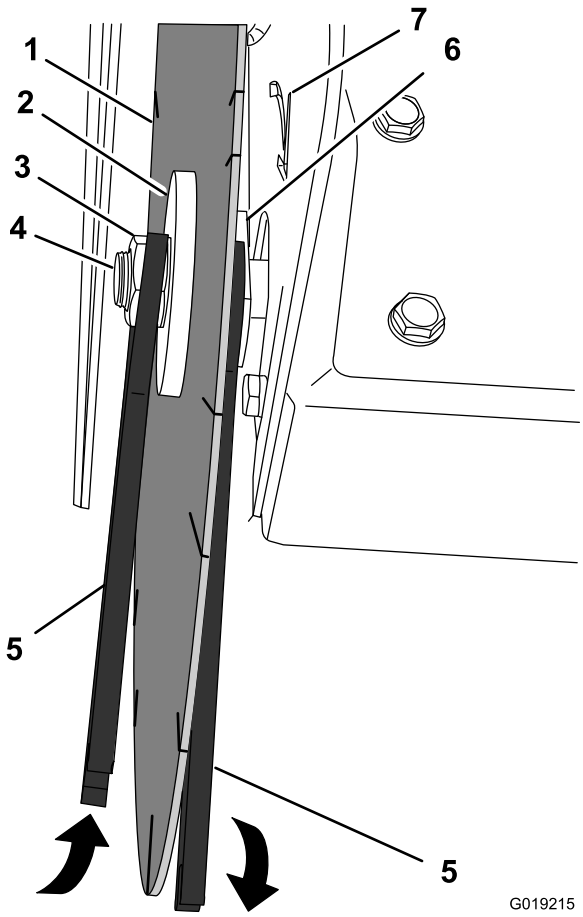


Figure 16
Blade and Arbor

1. Saw blade
2. Outer collar
3. Arbor nut
4. Arbor
5. Wrench
6. Inner collar
7. Arbor rotation arrow

8. Remove the lock washer, outer collar, and saw blade. Refer to Installing the Blade (page 13)

Installing the Blade

⚠ DANGER

Do not run the machine with loose or missing arbor parts.

Important: Always use the proper size blade guard and splash guard.

Blade Guard Size	Model 68045	Model 68046
35.56 cm (14 in)	**Standard**	Optional
40.64 cm (16 in)		Optional
45.72 cm (18 in)		**Standard**

1. Do the following before installing the saw blade:
   A. Park the machine on a level surface and turn off the engine; refer to Stopping the Engine (page 19).
   B. Ensure that the machine surfaces are cool.
   C. Disconnect the spark plug (Figure 13).
   D. Remove the 2 arbor wrenches from the storage bracket at the back-left side of the operator panel; refer to Removing the Blade (page 12).
   E. Open the forward section of the blade guard; refer to Removing the Blade (page 12).
   F. Inspect the outer collar, inner collar, drive pin, and arbor for damage. Clean the collar clamping surfaces, drive pin, and arbor with a clean rag.
   G. Inspect the inner collar and ensure that it is mounted tight on the arbor.
   H. Remove any burrs on the arbor, collar clamping surfaces and saw blade clamping surfaces.
   I. Inspect the blade guard and the water tubes inside the blade guard for damage.
2. Install the blade as follows:
   A. Ensure that the rotation arrow on the saw blade points in the same direction as the rotation arrow on the outer blade guard side.

      Note: Ensure that the blade elevation is raised adequately to install the blade.

   B. Align the arbor hole in the saw blade to the arbor and move the blade toward the inner collar (Figure 17).

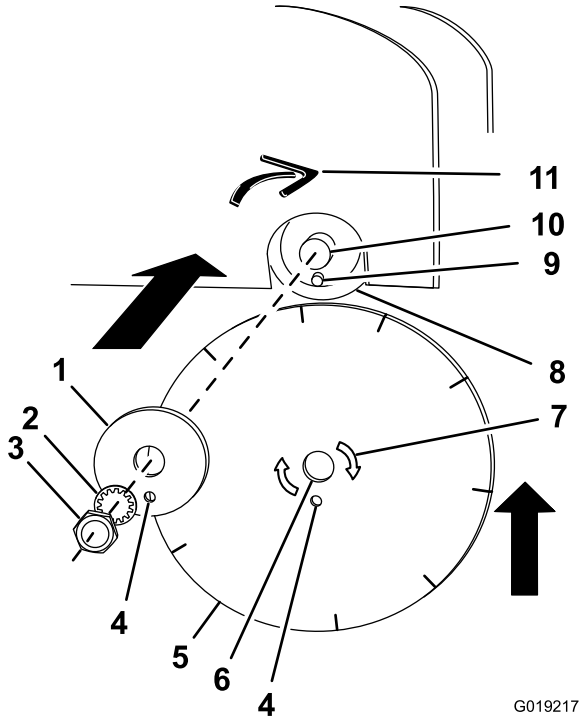


Figure 17
Blade Installation

1. Outer collar
2. Lock washer
3. Arbor nut
4. Drive-pin hole
5. Saw blade
6. Arbor hole
7. Rotation arrow (saw blade)
8. Inner collar
9. Drive pin
10. Arbor
11. Rotation arrow (blade guard)

C. Align the drive-pin hole in the blade to the drive pin that is protruding from the inner collar. Seat the blade against the inner collar (Figure 17).

Important: Ensure that the saw blade has a slip fit with the arbor and drive pin. If there is excessive movement between the blade and the arbor and pin, replace the worn parts before operating the machine.

Note: Check that the water tubes inside the blade guard are clear of the blade.

D. Align the outer collar to the arbor and move it toward the blade (Figure 17).

E. Align the drive-pin hole in the outer collar with the drive pin protruding through the saw blade, and then seat the collar against the blade (Figure 17).

F. Rotate the outer collar and saw blade in the opposite direction of the rotation arrow on the blade guard to remove any residual drive pin backlash

G. Install the lock washer and arbor nut (Figure 17).

H. Place one arbor wrench on the flats of the inner collar and place the other wrench on the arbor nut. Tighten the arbor nut by rotating it clockwise.

3. Lower the front blade guard section, stow the arbor wrenched in storage bracket, and connect the spark plug.
4. Start the engine and allow the machine to run at full throttle for 30 seconds; refer to Starting the Engine (page 19).
5. Stop the engine.

Adjusting the Cutting Depth

Important: For cut depth limits, refer to the machine Specifications (page 10).

Note: Rotate the elevation crank clockwise to raise the blade; rotate the elevation crank counterclockwise to lower the blade.

Changing Cut Depth

Important: Each revolution of the blade elevation crank raises or lowers the blade approximately 11 mm (7/16 inch).

1. Adjust the saw blade to the **Start Elevation** by doing the following:
   A. Align the machine to the cutting path of the job-site surface.
   B. Using the blade elevation crank (Figure 18), rotate the crank counterclockwise to lower the blade until the it touches the job-site surface.

      Note: The blade is at the +0 mm (+0 inch) elevation.

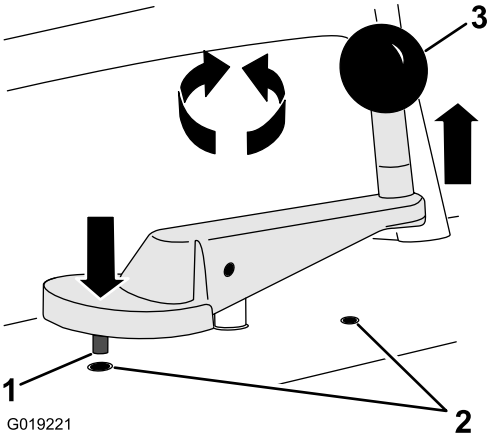


Figure 18
Elevation crank

1. Index pin
2. Index-pin hole
3. Elevation crank

C. Rotate the elevation crank 1 revolution clockwise to raise the blade elevation (Figure 18). The machine is at the **Start Elevation**.

Note: The **Start Elevation** is when the saw blade is at +11 mm (+7/16 inch) above the job-site surface. Raise the saw blade to the start elevation when moving the machine, maintaining the machine, and starting and stopping the engine

2. Adjust the cut depth of the saw blade as follows:
   - Rotate the elevation crank clockwise to raise the blade elevation.
   - Rotate the elevation crank counterclockwise to lower the blade elevation.

Adjusting the Blade-Depth Gauge (Model 68046)

1. Adjust the blade elevation to the +0 mm (+0 inch) elevation; refer to steps A and B in Changing Cut Depth (page 14).
2. Rotate the dial of the blade-depth gauge until the pointer (white) is aligned with the "-0" mark on the gauge (Figure 18).

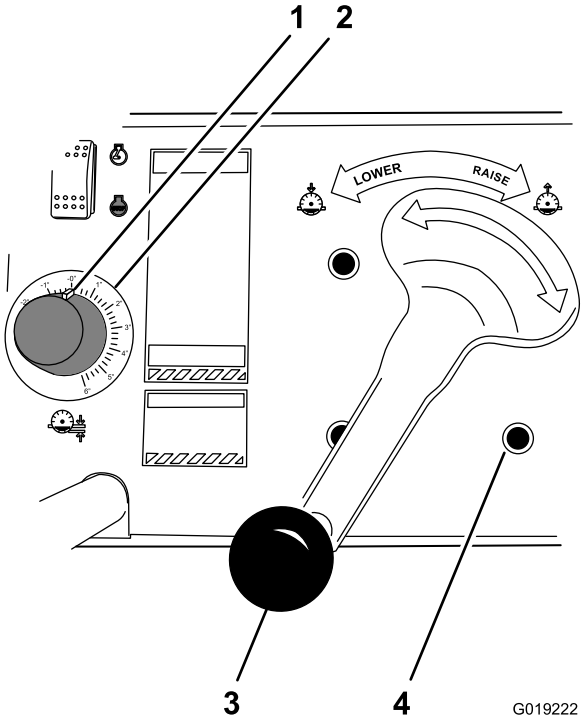


Figure 19
Blade Depth Gauge

1. Dial and pointer
2. Blade-depth gauge
3. Elevation crank
4. Index-pin hole

3. Raise the saw blade to the **Start Elevation**; refer step C in Changing Cut Depth (page 14).

   Note: Refer to the blade depth gauge when raising and lowering the saw blade (Figure 19).

Locking the Blade Elevation

The blade elevation can be locked when maintaining the blade elevation is desirable. Lock the blade elevation as follows:

1. Raise or lower the saw blade by rotating the elevation crank until the desires blade elevation is achieved (Figure 18).
2. If necessary, rotate the elevation crank to align the index pin in the bottom of the crank handle with a index-pin hole in the operator panel (Figure 18).
3. Pull the elevation crank up to engage the index pin in the hole (Figure 18).

   Note: To unlock the blade elevation, push down the elevation crank to disengage the index pin from the index hole.

Aligning the Pointer

Note: Model 68045 has a front pointer. Model 68046 has a front and back pointer.

1. Ensure that the saw blade is at the **Start Elevation**; refer to step C in Changing Cut Depth (page 14).
2. Park the machine on a level surface and turn off the engine; refer to Stopping the Engine (page 19).
3. Ensure that the machine surfaces are cool.

   Note: Ensure that the blade is installed; refer to Installing the Blade (page 13).

Aligning the Front Pointer

Note: The front pointer alignment procedure requires a 1.2 m (4 ft) minimum length of mason line.

1. Lower the forward pointer.
2. Pull a length of mason line across the surface of the saw-blade core and extend it to the end of the pointer (one straight line) as shown in figure Figure 20.
3. Adjust the pointer position as follows:
   - **Model 68045**—Align the front pointer by carefully bending the bar of the pointer until it is aligned with the mason line (Figure 20).

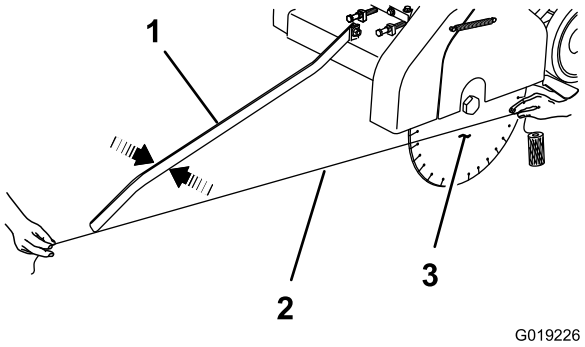


Figure 20
Pointer Alignment (Model 68045)

1. Pointer
2. Mason's line
3. Saw-blade core

- **Model 68046**—Align the front pointer by doing the following:

  A. Loosen thumbscrew that secures the forward pointer to the pointer fork (Figure 21).

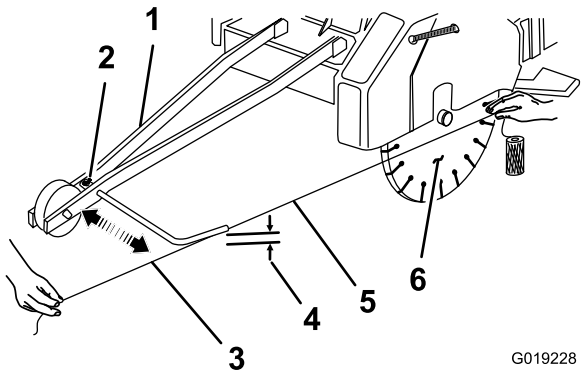


Figure 21
Forward Pointer Alignment (Model 68046)

1. Pointer fork
2. Thumbscrew
3. Forward pointer
4. 3–6 mm (1/8–1/4 inch)
5. Mason line
6. Saw-blade core

  B. Slide the pointer left or right to align it with the mason line, and elevated 3–6 mm (1/8–1/4 inch) above the job site surface (Figure 21).

  C. Tighten the thumbscrew that secures the forward pointer to the pointer fork (Figure 21).

Aligning the Rear Pointer (Model 68046)

Note: The rear pointer alignment procedure requires a 3 m (10 ft) minimum length of chalk line.

Note: Align the front pointer before aligning the rear pointer; refer to Aligning the Front Pointer (page 15).

1. Mark a 3 m (10 ft) or longer line on the job site surface by snapping a chalk line on the surface (Figure 22).

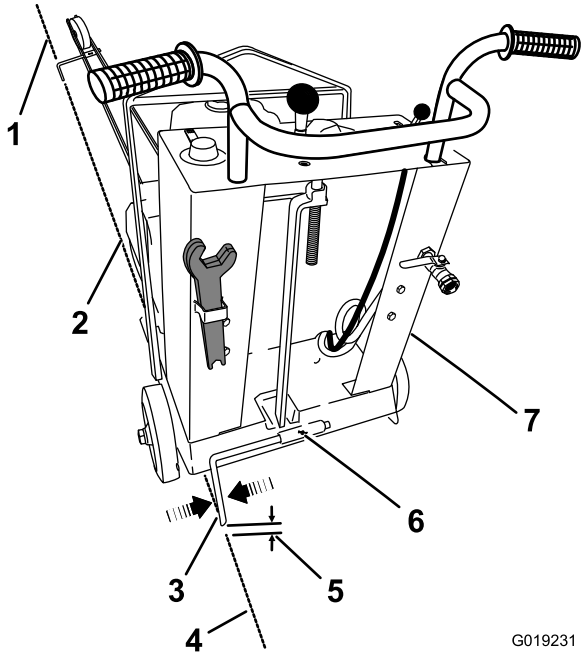


Figure 22
Rear Pointer Alignment (Model 68046)

1. Forward pointer
2. Saw blade
3. Rear pointer
4. Chalk line
5. 3–6 mm (1/8–1/4 inch)
6. Thumbscrew
7. Console

2. Align the saw blade and the forward pointer to the line marking the job site surface (Figure 22).
3. At the back of the console, loosen thumbscrew that secures the pointer to the back of the base and rotate the pointer down (Figure 22).
4. Slide the pointer left or right to align it to the line marking the job site surface, and elevate the pointer 3–6 mm (1/8–1/4 inch) above the site surface (Figure 22).
5. Tighten the thumbscrew that secures the pointer to base of the machine (Figure 22).

Adding Fuel

- For best results, use only clean, fresh, unleaded gasoline with an octane rating of 87 or higher ((R+M)/2 rating method).
- 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.

⚠ DANGER

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

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

⚠ DANGER

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

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

⚠ WARNING

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

- **Avoid prolonged breathing of vapors.**
- **Keep face away from nozzle and gas tank or conditioner opening.**
- **Keep gas away from eyes and skin.**

Important: Do not mix oil with gasoline.

Recommended Fuel

Unleaded Gasoline	
U.S.	Pump octane rating 87 or higher
Except U.S.	Research octane rating 92 or higher Pump octane rating 87 or higher

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: The fuel tank capacity is 6.1 liter (1.61 US Gallon).

1. Park the machine on a level surface, stop the engine, and allow the engine to cool.
2. Clean around the fuel tank cap and remove it (Figure 23).

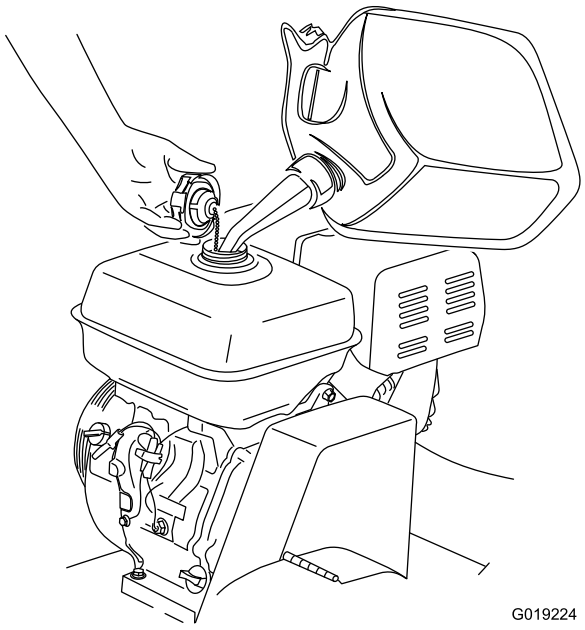


Figure 23

1. Fuel tank cap

3. Add unleaded gasoline to the fuel tank, until the level is 1/4 to 1/2 inch below the bottom of the filler neck.

   Important: This space in the tank allows gasoline to expand. Do not fill the fuel tank completely full.

4. Install the fuel tank cap securely.
5. Wipe up any gasoline that may have spilled.

Servicing the Engine Oil

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

Important: Use 4-stroke motor oil that meets of exceeds the requirements for API service category *SJ or later* (or equivalent). Always check the API service label on the oil container to be sure it includes the SJ or later (or equivalent).

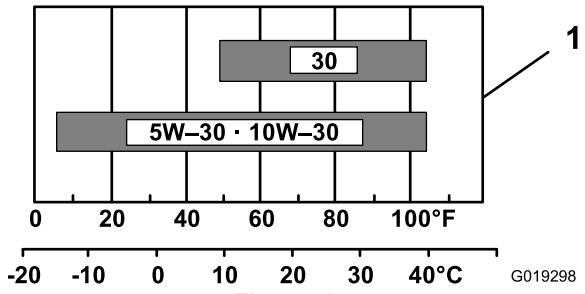


Figure 24
Recommended Oil Viscosity

1. Oil viscosity range for ambient operating temperatures

Note: SAE 10W-30 is recommended for general use. Other viscosities shown in the chart may be used when the average temperature in your area is within the indicated range.

Checking the Engine Oil Level

Important: Running the engine with low oil level can cause engine damage. This type of damage is not covered by warranty.

The engine is equipped with an oil alert system that will automatically stop the engine before the oil level falls below the safe limit.

1. If the saw blade is installed, do the following:
   A. Ensure that the saw blade is at the **Start Elevation**; refer to stepC in Adjusting the Cutting Depth (page 14).
   B. Remove the saw blade; refer to Removing the Blade (page 12).
2. Level the engine by raising or lowering it with the elevation crank; refer to Adjusting the Cutting Depth (page 14).
3. Clean around the oil dipstick.
4. Remove the oil filler/dip stick and wipe it clean (Figure 25).

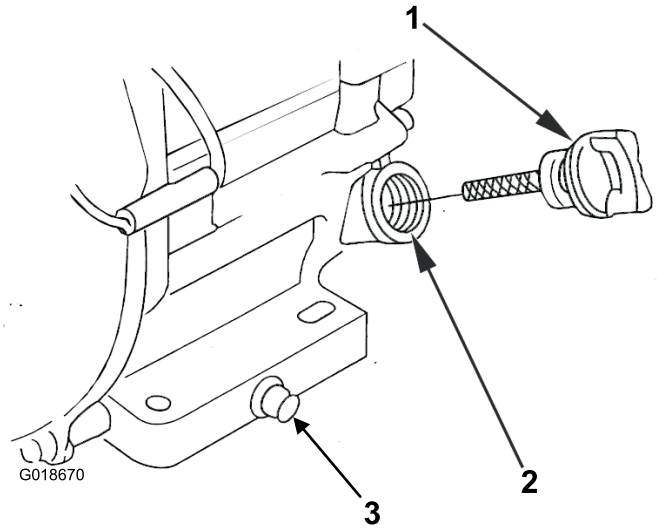


Figure 25
Oil Filler/Dip Stick

1. Oil filler cap/dipstick
2. Filler port
3. Drain Plug

5. Insert the oil filler/dipstick into the filler neck as shown in figure Figure 26, but do not thread it into the filler neck.

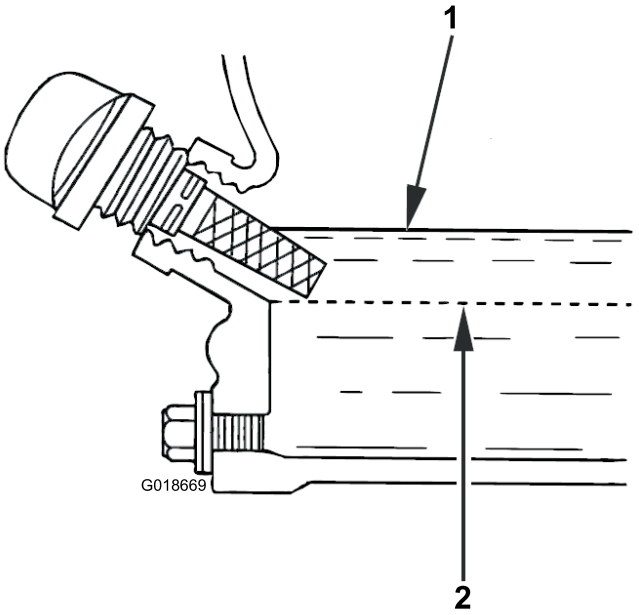


Figure 26
Maximum and Minimum Oil Levels

1. Upper oil limit
2. Lower oil limit

6. Remove the oil filler/dipstick from the filler port and look at the end of the dipstick. The oil level should be to the top of the upper limit range (Figure 26).

   Important: Do not overfill the crankcase with oil because the engine may be damaged.

7. If the oil level is low, slowly pour only enough oil into the engine crankcase to raise the level to the upper limit.
8. Thread the dipstick into the filler port hand tight.
9. If the machine is being operated, install the saw blade; reference Installing the Blade (page 13).

Starting and Stopping the Engine

Starting the Engine

1. Raise the saw blade to the **Start Elevation**; refer to step C in Adjusting the Cutting Depth (page 14).
2. **Model 68046**—On the operator panel, press the engine switch to the Run position; refer to Engine Switch (Model 68046) (page 9).
3. Position the throttle as follows:
   - **Model 68045**—On the engine, move the throttle lever away from the MIN. position, 1/3 of the way toward the MAX position; refer to Throttle Lever (Model 68045) (page 9).
   - **Model 68046**—On the operator panel, move the throttle control away from the Slow position, 1/3 of the way toward the Fast position; refer to Throttle Control (Model 68046) (page 9).

   Note: On model 68046 machines, do not use the throttle control lever on the engine.
4. On the engine, move the lever of the fuel valve to the On position—all the way to the right; refer to Fuel Valve (page 8).
5. To start a cold engine, move the choke lever to the Closed position—all the way to the left; refer to Choke Lever (page 9).

   Note: To restart a warm engine, leave the choke lever in the Open position (all the way to the right).
6. On the engine, rotate the engine switch to the On position; refer to Engine On/Off Switch (page 9).
7. Pull the recoil start handle lightly until you feel resistance, then pull the handle briskly. Return the starter handle gently (Figure 27).

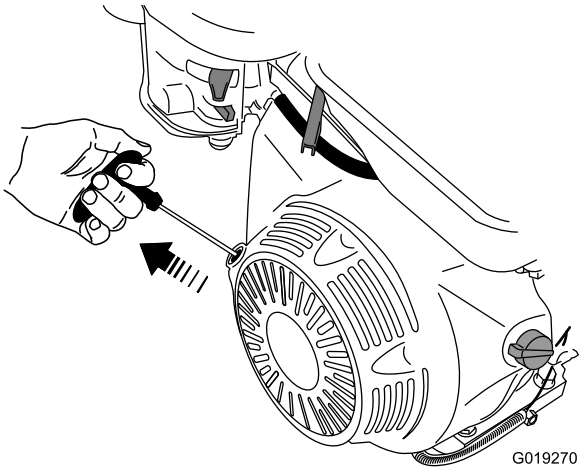


Figure 27
Starting the Engine

8. If the choke lever is set to the Closed position to start the engine, gradually move the choke lever back toward the Open position as the engine warms up. If the engine stalls or hesitates, move the choke lever back towards the Closed position until the engine runs smooth. Allow the engine to warm up, then move the choke lever to the Open position.

Stopping the Engine

⚠ WARNING

In an emergency situation, stop the engine immediately.

Important: During normal operation, if the engine has been working hard or is hot, let it run for a minute before stopping the engine. This helps to cool the engine before stopping.

During normal operating conditions, shut down the engine as follows:

1. Raise the saw blade to the **Start Elevation**; refer to Adjusting the Cutting Depth (page 14)
2. Ensure that the choke lever is in the Off position; refer to Choke Lever (page 9).
3. Do the following to stop the engine:
   - **Model 68045**
     A. On the engine, move the throttle lever to the MIN. position; refer to Throttle Lever (Model 68045) (page 9).
     B. Rotate the engine switch to the Off position; refer to Engine On/Off Switch (page 9).
   - **Model 68046**
     A. On the operator panel, move the throttle control to the Slow position; refer to Throttle Control (Model 68046) (page 9).
     B. On the operator panel, press the engine switch to the Stop position; refer to Engine Switch (Model 68046) (page 9).
     C. On the engine, rotate the engine switch to the Off position; refer to Engine On/Off Switch (page 9).
4. Move the lever on the fuel valve to the Off position; refer to Fuel Valve (page 8).

Emergency Stop

In an emergency situation, shut down the machine as follows:

- **Model 68045**—On the engine, rotate the engine switch to the **Off** position; refer to Engine On/Off Switch (page 9).

- **Model 68046**—On the operator panel, Press the engine switch to the **Stop** position; refer to Engine Switch (Model 68046) (page 9).

Cutting the Job-Site Surface

⚠ CAUTION

- **Operate the machine with the safety guards in place and in good condition.**
- **Do not operate the machine with a blade diameter larger than the specified capacity; refer to Specifications (page 10).**
- **Do not exceed the maximum RPM of the blade; refer to the maximum arbor speed in Specifications (page 10).**
- **Check the blade cooling requirements. Wet-cutting diamond blades must be used with coolant. Dry cutting blades can be used with or without coolant.**
- **Do not make long continuous cuts when dry cutting. Never dry cut for more than 30 seconds at a time. Allow the blade to cool between each pass.**
- **Do not dry cut with a blade recommended for wet cutting.**
- **Do not force the blade into the material; allow the blade to cut at its own rate.**
- **Do not cut or grind with the side of blade. Do not cut a curve of radius.**
- **Inspect the condition of the saw blade daily for excessive core wear, cracks, missing segments, arbor hole wear, and drive hole wear. Replace worn or damaged blades.**
- **Use care when lowering a the blade into an existing cut. Ensure that the blade is aligned with the cut.**

Connecting the Water Supply

1. Ensure that the water supply to the hose is turned off.
2. At the back of the machine and below the operator's console, locate the water shut off valve and coupling (Figure 28).

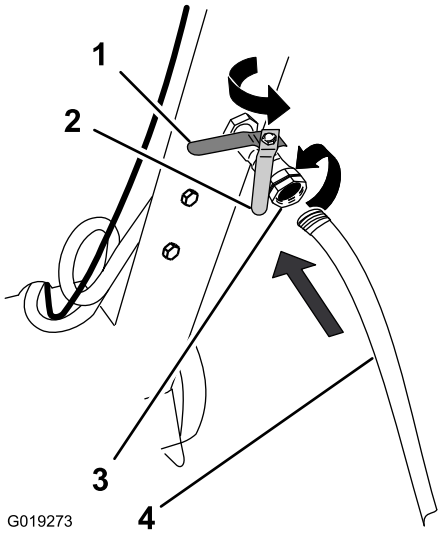


Figure 28
Water Shutoff Valve and Connector

1. Off position
2. On position
3. Shutoff valve and coupling
4. Water supply hose

3. Ensure that the handle for the shutoff valve is in the Off position (Figure 28).
4. Align the hose with the coupling and thread the coupling and hose together (Figure 28).
5. Tighten the coupling.

Cutting Operation

Prepare for the cutting operation by doing the following:

1. Raise the saw blade to the **Start Elevation** and lock the blade elevation by engaging the index pin of the crank handle with an index hole in the operator panel; refer to Adjusting the Cutting Depth (page 14) and Locking the Blade Elevation (page 15).
2. If the forward pointer is stowed in the up position, rotate the extended position (Figure 29).

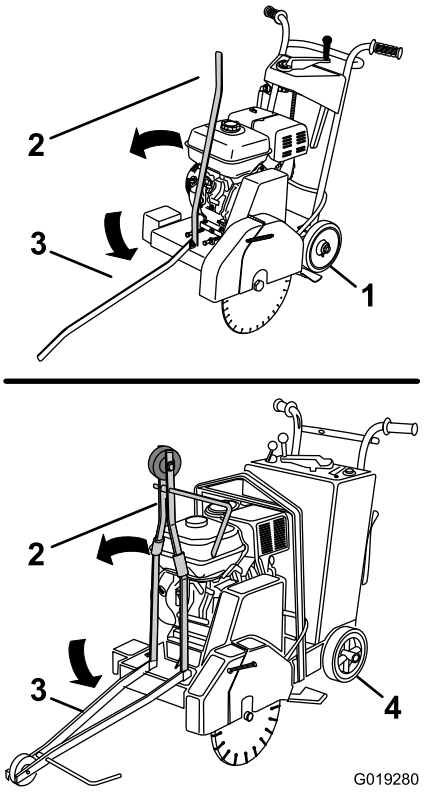


Figure 29
Forward Pointer (Models 68045 and 68046)

1. Model 68045
2. Stowed position
3. Extended position
4. Model 68046

3. Move the machine to align the pointer(s) and saw blade to the cutting path of the job-site surface.
4. If wet sawing, do the following:
   A. Connect the water line; refer to Connecting the Water Supply (page 20).
   B. Ensure that the handle of the water shutoff valve is in the Off position and water supply to the hose is turned on.
5. Start the engine; refer to Starting the Engine (page 19).

   Note: Allow the engine to warm up until it runs smoothly with the choke lever in the Open position.
6. Adjust the engine speed as follows:

   Note: All sawing is done at full engine speed.

   - **Model 68045**—Move the throttle lever to the MAX position.
   - **Model 68046**—Move the throttle control to the Fast position.
7. **If wet sawing,** rotate the handle of the water shutoff valve to the On position (Figure 28).

   Important: Ensure that water is flowing to the saw blade.

Begin the cutting pass by doing the following:

Important: For cuts deeper than 102 mm (4 inch), several cutting passes should be made in 38 mm (1–1/2 inch) to 51 mm (2 inch) steps until the desired cut depth is reached.

1. Unlock the blade elevation by pushing the elevation crank down to disengage the index pin. Rotate the elevation crank counterclockwise to lower the saw blade to touch the job-site surface.

   Note: The blade is at +0 mm (+0 inch) elevation.

   Note: For model 68046 machines, rotate the dial of the blade depth gauge to align the mark with zero; refer to step 2 in Adjusting the Blade-Depth Gauge (Model 68046) (page 15).

2. Slowly rotate the elevation crank counterclockwise to lower the saw blade into the cutting path of the job-site surface.

3. When the saw blade is at the desired cutting depth, align the index pin in the elevation crank with an index hole in the operator panel and lock the blade elevation; refer to Locking the Blade Elevation (page 15).

   Important: Avoid excessive side pressure or twisting of the blade while it is in the cut. Use only enough side pressure on the handle bar of the machine to align the it to the cutting path.

4. Push the machine steadily forward. Feed the machine into the cut as fast as the saw blade will allow. If the blade climbs out of the cut, reduce the forward-feed force or reduce the depth of the cut.

   Note: Exert enough feed force on the machine so that the engine begins to labor, but the blade RPM does not slow. If the engine begins to stall, reduce the feed force to the machine until the full blade RPM is restored.

Finish the cutting pass by doing the following:

1. At the end of the cutting pass, unlock the blade elevation and raise the saw blade to the **Start Elevation**; refer to Adjusting the Cutting Depth (page 14).
2. Lock the blade elevation; refer to Locking the Blade Elevation (page 15).
3. **If wet sawing,** rotate the handle of the water shutoff valve to the Off position (Figure 28).
4. Adjust the engine speed and allow it to idle at minimum engine speed for 5 minutes as follows:
   - **Model 68045**—Move the throttle lever to the MIN position.
   - **Model 68046**—Move the throttle control to the Slow position.

   Note: Idling the engine before shutting the it off improves the engine service life.
5. Shut off the engine; refer to Stopping the Engine (page 19).

Changing the Cutting Position

Use this procedure to configure a machine with the blade on the right side to a machine with the blade on the left side, or change the saw blade position from the left side to the right.

Note: The illustrations below show changing the blade position from a left-hand installation to a right-hand installation.

Preparing the Machine for the Position Change

1. Prepare the machine for the position change by doing the following:
   A. Raise the saw blade to the **Start Elevation**; refer to step C in Changing Cut Depth (page 14).
   B. Park the machine on a level surface and turn off the engine; refer to Stopping the Engine (page 19).
   C. Ensure that the machine surfaces are cool.
   D. Disconnect the spark plug (Figure 13).
2. Remove the blade as follows:
   A. Remove the 2 wrenches from the storage bracket at the back-left side of the operator panel and remove the saw blade; refer to Removing the Blade (page 12).
   B. Assemble the outer collar, lock washer, and arbor nut to the arbor. Tighten the nut.

Changing the Water Hose Position

Reposition the water hose as follows:

1. Release the inner and outer serrated segments from the hose clamp that secures the water hose to the barbed fitting in the blade guard (Figure 30).

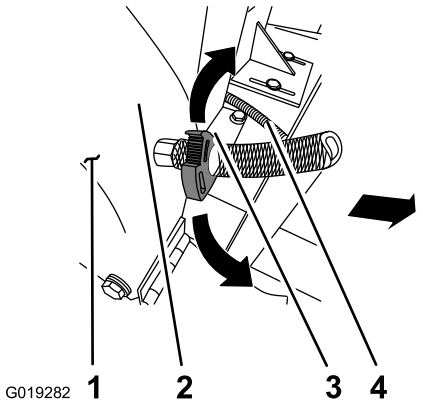


Figure 30
Water Hose and Fitting

1. Saw blade guard
2. Barbed fitting
3. Hose clamp
4. Water hose

2. Remove the water line from the barbed fitting.

   Note: Remove the hose clamp from the water line and retain it.

3. Route the water line as follows:

   - **Model 68045**—Route the water hose to the opposite side of the machine.
   - **Model 68046**

     A. Push the water hose in through the opening at the bottom-forward corner of the console (Figure 31).

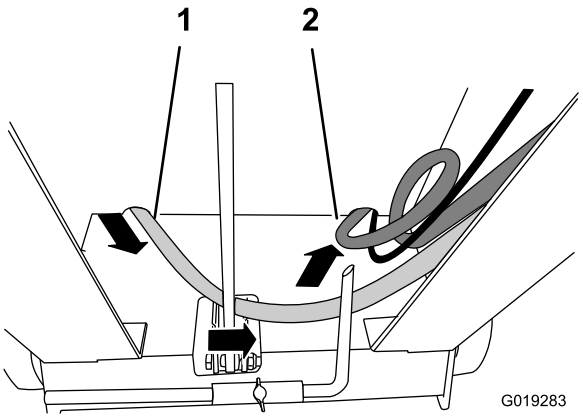


Figure 31
Rerouting the Water Hose

1. Left position
2. Right position

B. From inside the console, push the water hose out through the opening at the bottom-forward corner of the console on the opposite side (Figure 31).

Changing the Guard Position

1. Remove the blade guard and shaft guard as follows:

   A. Using a wrench from the machine, remove the forward bolt and washers, located inside the belt guard, that secure the guard to the base of the machine (Figure 32).

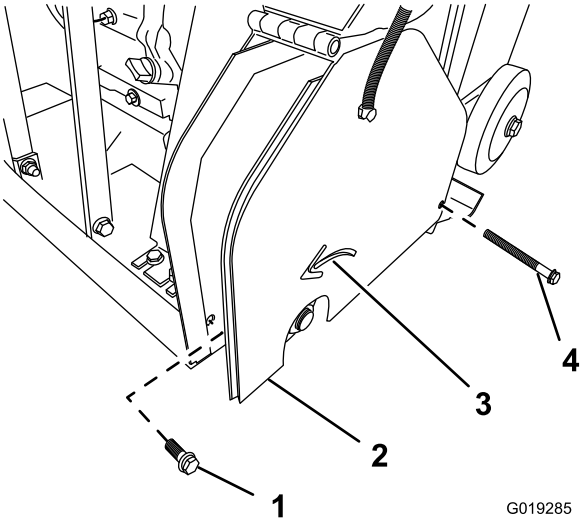


Figure 32
Blade Guard Removal

1. Forward bolt and washers
2. Blade guard
3. Rotation arrow
4. Rear bolt and washers

B. Support the belt guard and remove the rear bolt and washers that secures the guard to the base. Remove the guard (Figure 32).

C. Remove the bolts and washers that secure the shaft guard to the base of the machine, and remove the guard (Figure 33).

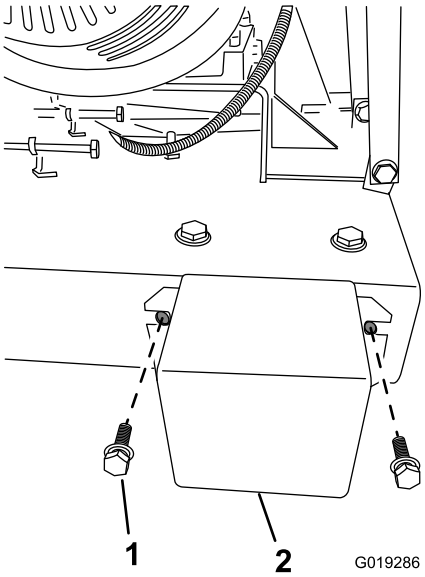


Figure 33
Shaft Guard Removal

1. Shaft guard
2. Bolt and washers

2. Install the blade guard as follows:

   Important: ***Left-hand*** **blade installation—ensure that the arrow on outside of the blade guard indicates** ***counterclockwise*** **rotation.**

Important: ***Right-hand*** **blade installation—ensure that the arrow on outside of the blade guard indicates** ***clockwise*** **rotation.**

A. Position the blade guard at the opposite side of the machine.

B. Align the cutout in the blade guard with the arbor.

C. Align the mounting holes of the blade guard with the holes in the base of the machine.

D. Loosely assemble the rear bolt and washers, removed in step 1–A, to the blade guard and into the base of the machine.

E. Secure the guard and to the base with the forward bolt and washers that were removed in step 1–B.

F. Tighten the rear bolt.

3. Install the water line as follows:

   A. Slip the clamp, removed in step 2 of Changing the Water Hose Position (page 22), over the free end of the water hose (Figure 34).

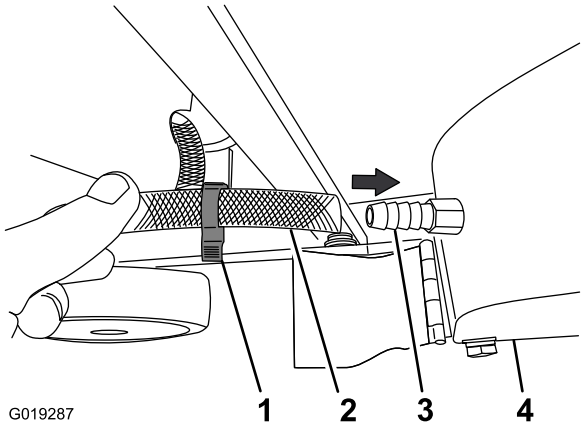


Figure 34

Water Hose Assembly

1. Hose clamp
2. Water hose
3. Barbed fitting
4. Blade guard

   B. Align the end of the water hose to the barbed fitting in the blade guard (Figure 34).

   C. Center the clamp over the fitting and squeeze the clamp tight.

4. Install the shaft guard as follows:

   A. Align the mounting holes in the shaft guard with the holes in the base.

   B. Secure the shaft guard to the base of the machine with the bolts removed in step 1–C.

Changing the Forward Pointer Position (Model 68045)

1. Change the position of the forward pointer as follows:

   A. Remove the bolt, washers, and nut that secure the pointer to the mounting tab on base of the machine (Figure 35).

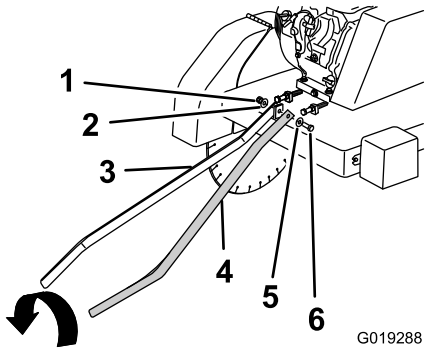


Figure 35

Pointer Position Change (Model 68045)

1. Nut
2. Washer
3. Right-hand position
4. Left-hand position
5. Washer
6. Bolt

   B. Align the pointer to the other side of the machine (Figure 35).

   C. Align the hole in the pointer with the mounting tab on the base.

   D. Secure the pointer to the base with the bolt, washers and nut removed in step A (Figure 35).

2. Install the saw blade; refer to Installing the Blade (page 13).

3. Align the pointer(s); refer to Aligning the Front Pointer (page 15).

Changing the Forward and Rear Pointer Position (Model 68046)

1. Change the position of the forward pointer as follows:

   A. At the forward pointer, loosen the thumbscrew that secures the pointer to the pointer fork (Figure 36).

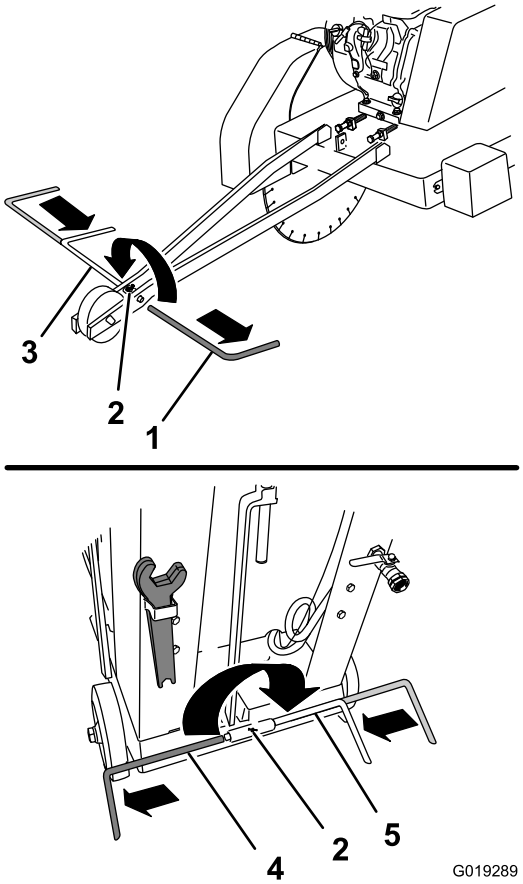


Figure 36

Pointer Position Change (Model 68046)

1. Forward pointer, left-hand position
2. Thumbscrew and cross tube
3. Forward pointer, right-hand position
4. Rear pointer, right-hand position
5. Rear pointer, right-hand position

B. Remove the pointer from the cross tube in the pointer fork and insert it into the cross tube at the opposite side of the fork (Figure 36).

C. Tighten the thumbscrew.

2. Change the position of the forward pointer as follows:

A. At the rear pointer, loosen the thumbscrew that secures the pointer to the cross tube on the base of the machine (Figure 36).

B. Remove the pointer from the cross tube and insert it into the opposite end of the cross tube (Figure 36).

C. Tighten the thumbscrew.

3. Install the saw blade; refer to Installing the Blade (page 13).

4. Align the forward and rear pointers as described in Aligning the Pointer (page 15).

Transporting the Machine

Prepare the Machine for Transport

1. Remove the saw blade.
2. Rotate the elevation crank counterclockwise to lower the machine to the lowest elevation height.
3. Move the lever on the fuel valve to the Off position—all the way to the left; refer to Fuel Valve (page 8).
4. Raise and secure the forward pointer to the stowed position (Figure 29).
5. **Model 68046**—stow the rear pointer (Figure 22).

Lifting the Machine

Move the machine on to the transport vehicle as follows:

- Using a ramp that is rated for the weight of the machine, push the it up the ramp and on to the vehicle.
- Lift the machine onto the transport vehicle.

Note: Model 68046—If a lifting equipment of adequate capacity is available, secure the cable, chain, or strap to the lifting bale and lift the machine.

Securing the Machine for Transport

Do the following to prevent movement of the machine on the transport vehicle:

- Secure the machine with cabling, straps, or chains to the transport vehicle.
- Protect the machine by padding the cabling, straps, and chains where contact with the surfaces of the machine occurs.
- Secure blocking to the bed of the transport vehicle, and around the base of the machine.

Maintenance

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

Important: The machine may be tipped backward or on its side to facilitate access for cleaning or service, but no longer than 2 minutes. If the machine is held in this position for too long, the engine can be damaged by gasoline draining into the crankcase. Should this happen, perform an extra oil change on the engine. Then turn the engine over a few revolutions with the recoil start handle before starting the engine again.

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first 50 hours	• Change the oil.
Before each use or daily	• Check the engine oil level. • Grease the machine. • Lubricate the elevation screw. • Check the air filter condition. Check more frequently if operating conditions are dusty. • Check the condition of the saw blade condition for wear and damage.
After each use	• Clean the machine.
Every 25 hours	• Change the oil when operated under heavy loads or in high temperatures.
Every 40 hours	• Check the pulley security and alignment, and the drive belt tension. Replace the damaged belts as needed.
Every 50 hours	• Service the cyclone housing/filter. Clean the housing/filter more frequently when operating the machine in dusty conditions. • Clean the air filter. Clean more frequently if operating conditions are dusty.
Every 100 hours	• Change the oil. • Clean the sediment cup. • Check the spark plug. • Clean the spark arrester.
Every 300 hours	• Replace the air filter. Change the air filter more frequently if operating conditions are dusty. • Replace the spark plug.
Yearly or before storage	• Change the oil. • Clean the fuel sediment cup.
Every 2 years	• Replace all drive belts. Replace the belts if any shows any signs of wear, cracks, glazing, or damage.

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

Lubrication

Greasing the Machine

Service Interval: Before each use or daily

Grease Type: General-purpose grease.

1. Grease the tilt bearing and arbor bearing blocks by doing the following:
   A. Elevate the blade to its highest position.
   B. At the front of the machine, find the grease fittings for the tilt bearing and arbor bearing blocks that are located beneath the base of the machine (Figure 37).

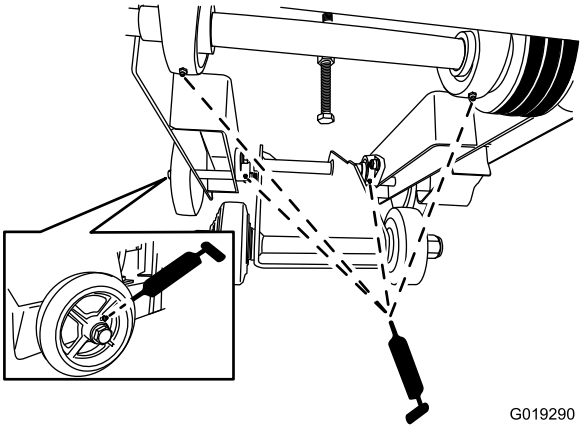


Figure 37

   C. Clean the grease fittings with a rag.
   D. Connect a grease gun to each fitting.
   E. Pump grease into the fittings until either grease begins to ooze out of the bearings or 3 pumps.
   F. Wipe up any excess grease.

      Important: Pump grease in slowly and carefully to prevent damage to the bearing seals.

   G. Lower the saw blade elevation to the **Start Elevation**.
2. Grease the wheel bearings as follows:
   A. Locate the grease fittings at the rear wheels (Figure 37).
   B. Clean the grease fittings with a rag.
   C. Connect a grease gun to each fitting.
   D. Pump grease into the fittings until grease begins to ooze out of the bearings (approximately 3 pumps).
   E. Wipe up any excess grease.

      Important: Pump grease in slowly and carefully to prevent damage to the bearing seals.

Lubricate the Elevation Screw

Service Interval: Before each use or daily

1. Using a rag, wipe the elevation screw and tilt arm clean of excess lubricant, dirt, and dust.

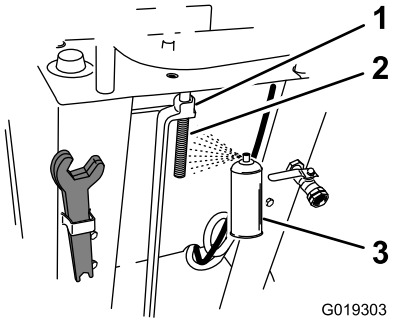


Figure 38

Lubricating the Blade Elevation Screw

1. Tilt arm
2. Elevation screw
3. Dry-graphite lubricant (120-4817)

2. Slowly rotate the elevation crank while applying a coat of dry-graphite lubricant (Toro part number 120-4817) or equivalent on the threads of the elevation screw.

Engine Maintenance

Servicing the Air Filter

Service Interval: Before each use or daily—Check the air filter condition. Check more frequently if operating conditions are dusty.

Every 50 hours—Service the cyclone housing/filter. Clean the housing/filter more frequently when operating the machine in dusty conditions.

Every 50 hours—Clean the air filter. Clean more frequently if operating conditions are dusty.

Every 300 hours/Yearly (whichever comes first)—Replace the air filter. Change the air filter more frequently if operating conditions are dusty.

The cyclone air filter collects the largest contaminant particles, which collect in the container. When you can see a layer of dirt at the bottom of the container, clean the cyclone housing, air channels, and air intake screen.

Servicing the Cyclone Air Filter

1. Remove the 3 screws that secure the cyclone housing to the air filter housing.
2. Remove the cyclone housing with the air intake screen, and remove the air guide (Figure 39).

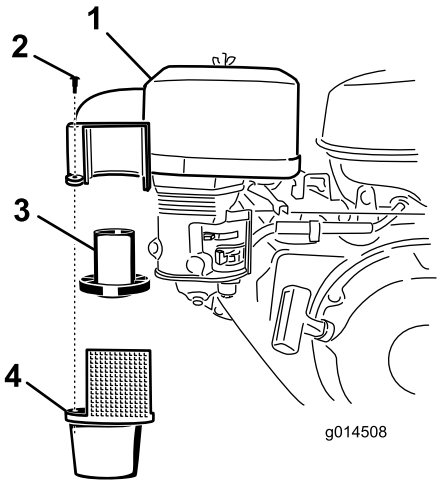


Figure 39

1. Air filter cover
2. Screw
3. Air guide
4. Cyclone housing with air intake screen

Note: The air guide may remain in the air filter cover when the cyclone housing is removed. Grasp the air guide and carefully pull down to remove it.

3. Clean the components using water and a brush. Dry carefully.
4. Seat the air guide into the cyclone housing.
5. Align the air intake screen of the cyclone housing with the opening in the air filter cover. Carefully assemble the cyclone housing the filter housing (Figure 39).

Note: Ensure that the slot in the cyclone cover that is adjacent the air intake screen is aligned with the tab in the bottom of the air filter cover; **Do not** use force; align it in place.

6. Secure the cyclone housing to the air filter cover with the screws removed in step 1 (Figure 39).

Cleaning the Air Filter

Important: If the engine is low on power, produces black smoke or runs unevenly, the air filter may be restricted.

1. Remove the wing nut and lift off the air filter cover and cyclone housing (Figure 40).

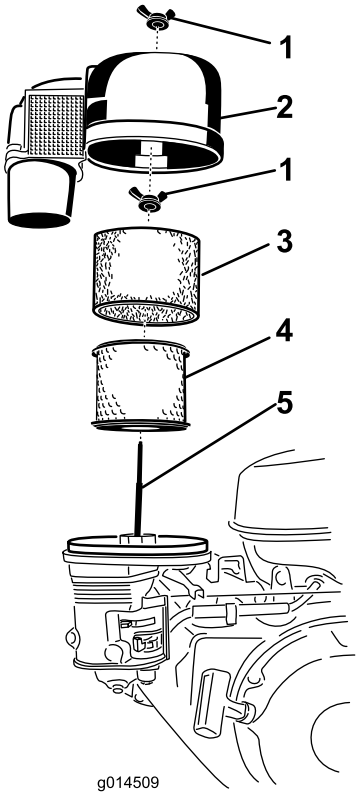


Figure 40

1. Wing nut
2. Air filter cover and cyclone housing
3. Foam pre-filter
4. Air–filter element
5. Stud

Important: Replace the foam pre-filter or the air-filter element or both if damaged.

2. Remove the foam pre-filter. Clean it as follows:
   A. Clean the pre-filter using warm soapy water.
   B. Rinse the pre-filter in clean water, squeeze the water out, and allow the filter to dry.
   C. Soak it with new engine oil.

D. Gently wind the filter in an absorbent cloth and squeeze out excess oil.

3. Remove the wing nut on top of the air filter and remove the paper filter (Figure 40).
4. Tap the air-filter element against a fixed surface several times to remove dirt. If the paper filter is still dirty or damaged, replace the filter element.

   Important: Do not use compressed air to blow out the paper element, this can damage it.

   Note: Replace the air-filter element every 300 hours.
5. Align the air-filter element on the lower air-filter housing and secure it with the wing nut removed in step 3 (Figure 40).
6. Position the foam pre-filter over the air-filter element (Figure 40).
7. Align the air-filter cover and cyclone housing with the stud and lower air-filter housing, and secure the cover with the wing nut removed in step 1 (Figure 40).

Replacing the Air Filter

1. Remove the wing nut and lift off the air filter cover and cyclone housing (Figure 40).
2. Remove the wing nut on top of the air filter and remove the pre-filter and air-filter element (Figure 40).
3. Align the new pre-filter and air-filter element with the lower air-filter housing and secure it with the wing nut removed in step 2 (Figure 40).
4. Align the air-filter cover and cyclone housing with the stud and lower air-filter housing, and secure the cover with the wing nut removed in step 1 (Figure 40).

Changing the Engine Oil

Service Interval: After the first 50 hours/Monthly (whichever comes first)—Change the oil.

Every 100 hours/Every 6 months (whichever comes first)—Change the oil.

Every 25 hours—Change the oil when operated under heavy loads or in high temperatures.

Yearly or before storage—Change the oil.

Draining the Engine Oil

Drain the engine oil as follows:

1. Ensure that the saw blade is at the **Start Elevation**; refer to step C in Adjusting the Cutting Depth (page 14).
2. Start the engine and let it run five minutes; refer to Starting the Engine (page 19).

   Note: This warms the oil so it drains better.
3. Remove the saw blade; refer to Removing the Blade (page 12)
4. Lower the front of the engine by rotating the elevation crank counterclockwise; refer to Adjusting the Cutting Depth (page 14).
5. Place a drain pan with a 1.9 liter (2 US quart) capacity under the oil-drain port of the engine (Figure 41).

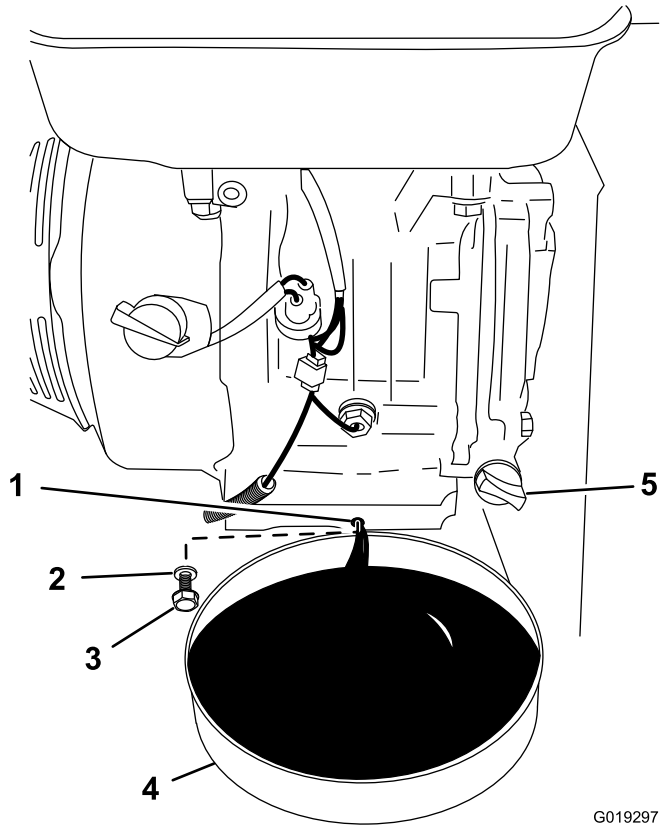


Figure 41
Draining the Engine Oil

1. Oil-drain port
2. Washer
3. Drain plug
4. Drain pan, 1.9 liter (2 US quart)
5. Oil fill cap/dipstick

6. Remove the drain plug and washer, and drain the oil (Figure 41).
7. When the oil has drained completely, install the drain plug with a new washer, and wipe up any spilled oil (Figure 41).

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

Filling the Engine Crankcase with Oil

Fill the crankcase with oil as follows:

Important: Use 4-stroke motor oil that meets of exceeds the requirements for API service category *SJ or later* (or equivalent). Always check the API service label on the oil container to be sure it includes the SJ or later (or equivalent).

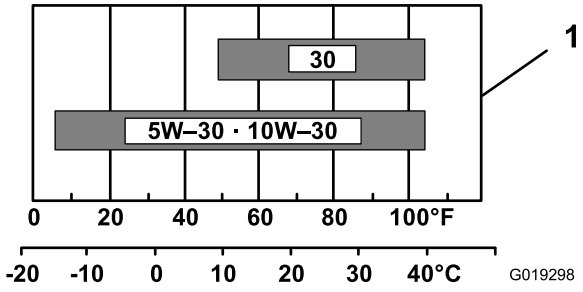


Figure 42
Recommended Oil Viscosity

1. Oil viscosity range for ambient operating temperatures

Note: SAE 10W-30 is recommended for general use. Other viscosities shown in the chart may be used when the average temperature in your area is within the indicated range.

1. Level the engine by raising it with the elevation crank; refer to Adjusting the Cutting Depth (page 14).
2. Remove the oil fill cap/dipstick and slowly pour approximately 80 percent of the specified amount of oil into the engine (Figure 41).
3. Slowly add additional oil to bring the oil level to the upper limit mark on the dipstick. Refer to Checking the Engine Oil Level (page 18).
4. Install the oil fill cap/dipstick.
5. Install the saw blade; refer to Installing the Blade (page 13).

Servicing the Fuel System

Cleaning the Sediment Cup

Service Interval: Every 100 hours/Every 6 months (whichever comes first)—Clean the sediment cup.

Yearly or before storage—Clean the fuel sediment cup.

Underneath the fuel valve is a sediment cup to catch dirt in the fuel.

1. Raise the saw blade to the **Start Elevation**; refer to step C in Changing Cut Depth (page 14).
2. Park the machine on a level surface and turn off the engine; refer to Stopping the Engine (page 19).
3. Ensure that the machine surfaces are cool.
4. Move the lever of the fuel valve to the Off position, all the way to the left (Figure 43).
5. Unscrew the sediment cup. Remove the fuel filter and O-ring (Figure 43).

   Note: Make sure not to misplace the O-ring

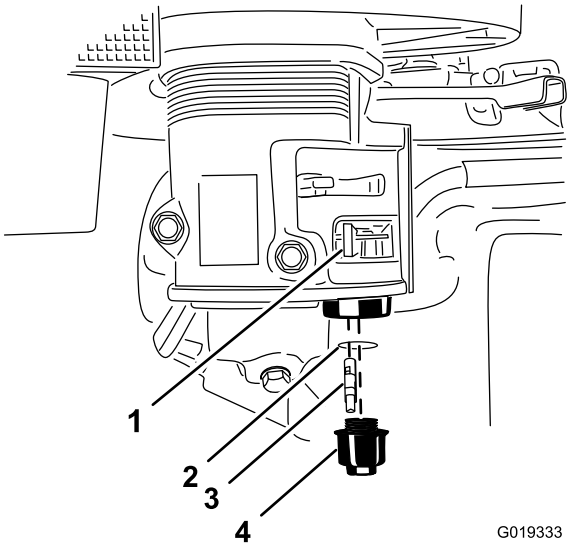


Figure 43
Sediment Cup and Fuel Filter

1. Fuel valve (Off)
2. O-Ring
3. Fuel filter
4. Sediment cup

Note: Do not clean the O-ring in solvent.

6. Clean the fuel filter and sediment cup using a nonflammable solvent and dry carefully.
7. Wipe the O-ring with a clean, dry cloth.
8. Install the fuel filter in the bottom of the carburetor (Figure 43).
9. Align the O-ring in to the groove in the sediment cup and install the sediment cup to fuel valve housing.
10. Move the lever of the fuel valve to the On position (all the way to the right) and check for leaks. If it leaks, replace the O-ring.

Servicing the Spark Plug

Service Interval: Every 100 hours/Every 6 months (whichever comes first)—Check the spark plug.

Every 300 hours/Yearly (whichever comes first)—Replace the spark plug.

Type: BPR6ES (NKG) or W20EPR-U (DENSO), or equivalent

Air Gap: 0.7–0.8 mm (0.28–0.031 inch)

Note: Use a 20 mm (13/16 inch) spark plug wrench for removing and installing the spark plug.

Removing the Spark Plug

1. Park the machine on a level surface and turn off the engine; refer to Stopping the Engine (page 19).
2. Ensure that the machine surfaces are cool.
3. Pull the spark plug wire off the terminal of the spark plug (Figure 44).

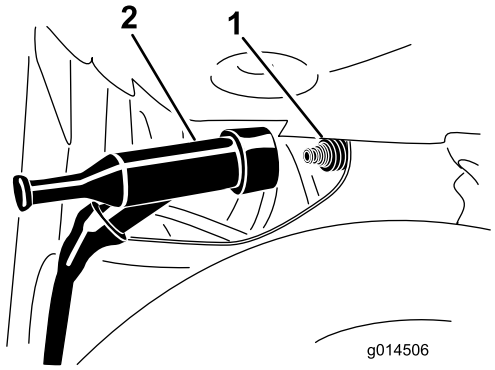


Figure 44

1. Spark plug
2. Wire

4. Clean around the spark plug.
5. Rotate the spark plug counterclockwise using a 20 mm (13/16 inch) spark plug wrench to remove the plug and sealing washer.

Checking the Spark Plug

Note: Use a gapping tool/feeler gauge to check and adjust the air gap. Install a new spark plug if necessary.

1. Look at the center of the spark plug (Figure 45). If you see light brown or gray on the insulator, the engine is operating properly.

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

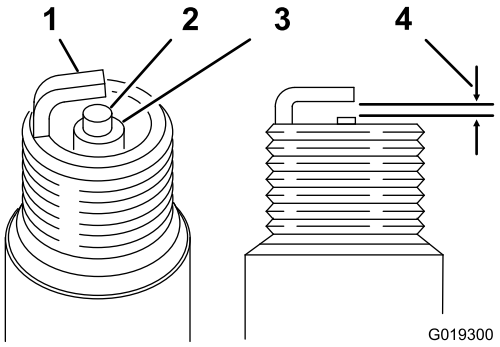


Figure 45
Spark Plug Air Gap

1. Side electrode
2. Center electrode
3. Insulator
4. 0.7– 0.8 mm (028–.031 inch) measured air gap range

2. With a gapping tool for spark plugs or feeler gauge, measure the gap between the side electrode and center electrode.
1. Check the gap between the center and side electrodes (Figure 45) if the gap is not correct.

2. If the measured air gap is not within the specified air gap range, do the following:

   A. If the gap is **too small**, carefully bend the side electrode **away** from the center electrode until the gap between the electrodes is within the measured air gap range.

   B. If the gap is **too large**, carefully bend the side electrode **toward** from the center electrode until the gap between the electrodes is within the measured air gap range.

Installing the Spark Plug

Important: Ensure that the air gap between the side and center electrodes are correct before installing the spark plug.

1. Thread the spark plug clockwise into the spark plug hole by hand.

   Note: Avoid cross threading the spark plug with the threads of the spark plug hole

2. Rotate spark plug clockwise using a 20 mm (13/16 inch) spark plug wrench until the plug and sealing washer are seated.

3. Tighten the plug as follows:

   - When installing an **in-service** spark plug, tighten the plug an additional 1/8–1/4 turn.
   - When installing a **new** spark plug, tighten the plug an additional 1/2 turn.

4. Install the spark plug wire pushing the wire onto the terminal of the plug.

Servicing the Spark Arrester

Service Interval: Every 100 hours/Every 6 months (whichever comes first)—Clean the spark arrester.

Cleaning the Spark Arrester

1. Remove the spark arrestor as follows:

   A. Remove the two 8 mm nuts and remove the muffler from the engine exhaust port (Figure 46).

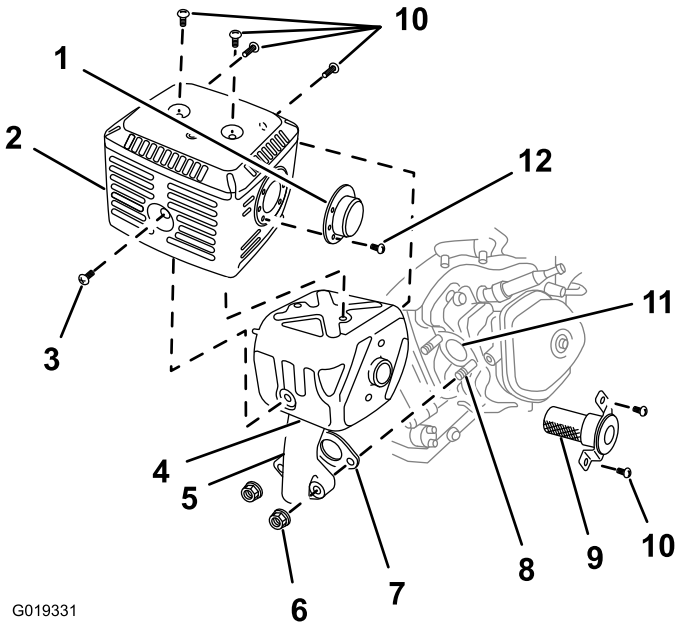


Figure 46

Muffler and Spark Arrester

1.	Exhaust deflector	7.	Exhaust-pipe gasket
2.	Muffler protector	8.	Stud
3.	6 mm screw	9.	Spark arrester
4.	Muffler	10.	5 mm screw
5.	Exhaust pipe	11.	Exhaust port
6.	Nut	12.	4 mm screw

   Note: Retain the exhaust-pipe gasket for the spark arrester installation.

   B. Remove the three 4 mm screws from the exhaust deflector, and remove the deflector from the muffler protector (Figure 46).

   C. Remove the 6 mm screw and four 5 mm screws from the muffler protector and remove the muffler protector from the muffler (Figure 46).

   D. Remove the 5 mm screws from the spark arrester, and remove the spark arrester from the muffler (Figure 46).

2. Use a brush to remove carbon deposits from the spark arrester screen. Replace the spark arrester if it has breaks or holes (Figure 47).

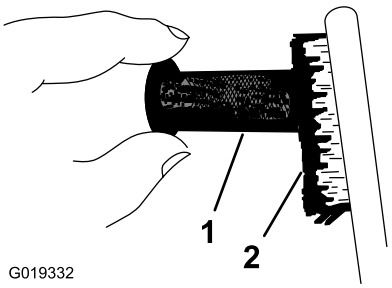


Figure 47
Cleaning the Spark Arrester

1. Spark arrester screen
2. Brush

Note: Be careful not to damage the screen.

3. Install the spark arrester as follows:
   A. Align the holes of the spark arrester to the spark arrester mounting points in the muffler.
   B. Secure the spark arrester to the muffler with the 5 mm screws removed in step 1-D.

      (Figure 46).
   C. Align the muffler protector to the muffler and secure it with the 6 mm screw and 5 mm screws removed in step 1-C (Figure 46).
   D. Align the exhaust deflector with the muffler protector and secure it with the 4 mm screws removed in step 1-B (Figure 46).
   E. Align the exhaust pipe gasket to the studs of the exhaust port and flush with the port.
   F. Align mounting points of the exhaust pipe with the studs of the exhaust port and secure it with the nuts removed in step 1-A (Figure 46).

Belt Maintenance

Servicing the Drive Belts

Service Interval: Every 40 hours—Check the pulley security and alignment, and the drive belt tension. Replace the damaged belts as needed.

Every 2 years—Replace all drive belts. Replace the belts if any shows any signs of wear, cracks, glazing, or damage.

Removing the Belt Guard

1. Park the machine on a level surface and turn off the engine; refer to Stopping the Engine (page 19).
2. Ensure that the machine surfaces are cool.
3. Pull the spark plug wire off the terminal of the spark plug (Figure 44).
4. Loosen the bolts that secure the rear mounting point of the belt guard to the base of the machine (Figure 48).

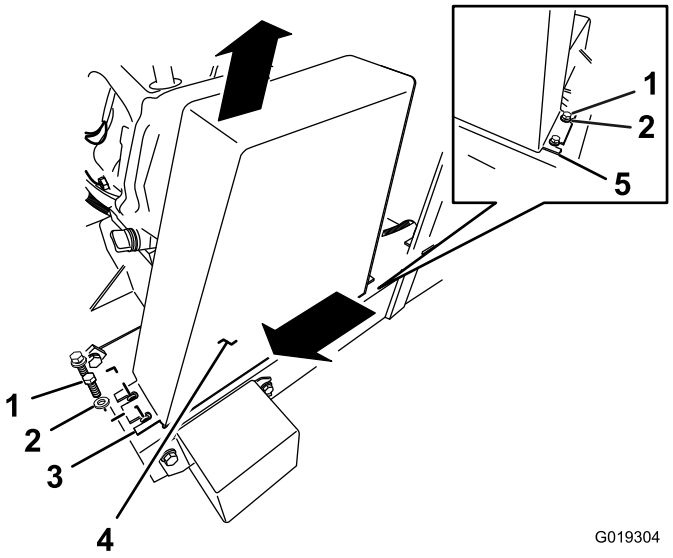


Figure 48
Belt Guard Removal

1. Bolt
2. Washer
3. Forward mounting point
4. Belt guard
5. Rear mounting point

5. Remove the forward bolts that secure the forward mounting point of the belt guard to base (Figure 48).
6. Slide the belt guard forward and lift the guard to remove it (Figure 48).

Checking the Pulleys and Drive Belts

1. Remove the belt guard; refer to Removing the Belt Guard (page 33).
2. Check that the arbor pulley is centered in the opening in the base of the machine. If the arbor pulley is misaligned, refer to step 3 in Aligning the Pulleys (page 36) (Figure 49).

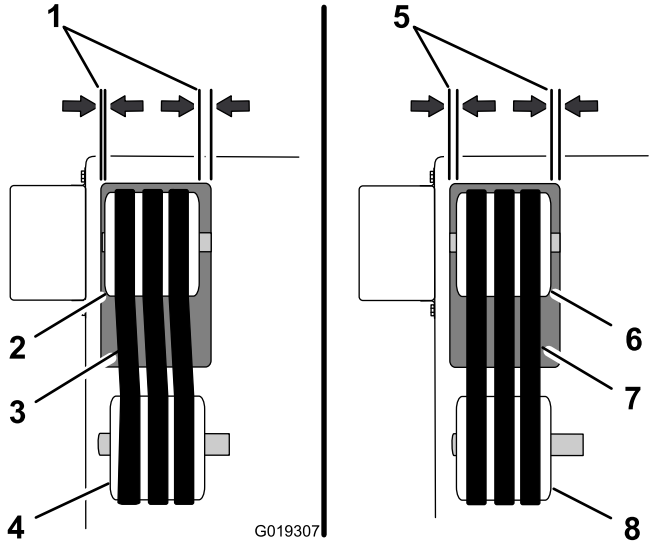


Figure 49
Pulley Alignment

1. Unequal spacing distance
2. Misaligned arbor pulley
3. Misaligned drive belts
4. Misaligned drive-shaft pulley
5. Equal spacing distance
6. Aligned arbor pulley
7. Aligned drive belts
8. Aligned drive-shaft pulley

3. Check pulley alignment by looking at the sides of the belts, each should run in a straight line over and between each pulley (Figure 49). If the belts and pulleys are misaligned, align the pulleys; refer to Aligning the Pulleys (page 36).

   Note: Drive belt misalignment is an indication of a pulley(s) that are not secure to the arbor or the drive shaft of the engine or both.

4. Check that the pulleys are secure as follows:

   Note: Use moderate force when checking the security of the pulleys. Belt tension may need to be reduced to check for a loose pulley.

   A. Check that the drive-shaft pulley is secure to the engine shaft by grasping the pulley and push it toward the engine and away from the engine. If the pulley is loose on the drive shaft of the engine, align and secure the pulley; refer to step 5 in Aligning the Pulleys (page 36).

   B. Check that the arbor pulley is secure to the arbor by prying between the opening in the base and ends of pulley with a screwdriver (Figure 50). If the pulley is loose on the arbor, align and secure the pulley; refer to step 3 in Aligning the Pulleys (page 36).

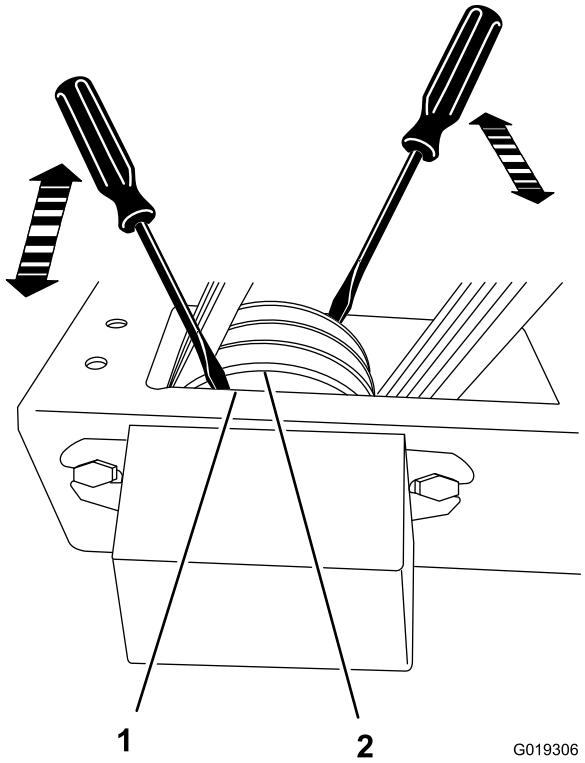


Figure 50
Lower Pulley Check

1. Lower pulley
2. Opening in the base

5. Check the tension of the drive belts by doing the following:

   Note: The best drive belt tension for the machine is the lowest tension at which the belts will not slip under full load.

   A. Lay a straightedge on each belt and across the drive shaft and arbor pulleys (Figure 51).

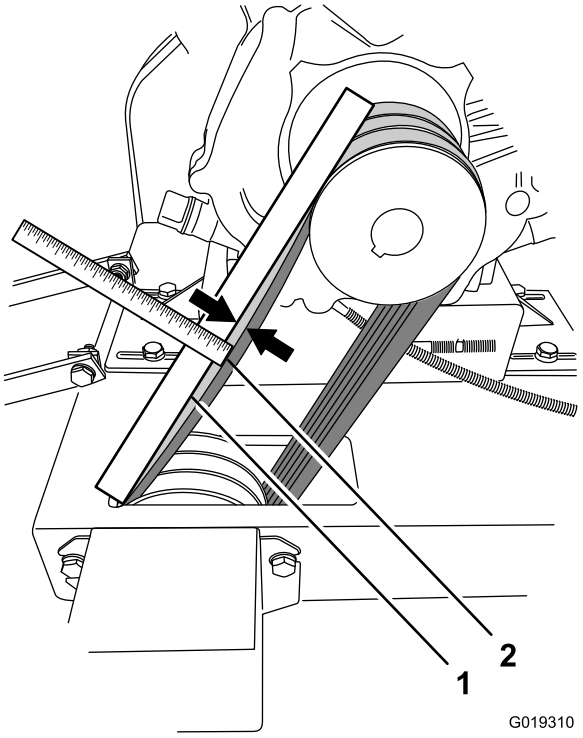


Figure 51
Measuring Belt Tension

1. Straight edge
2. Deflect 5 mm at 2 kg (.19 inch at 4.2 lb)

B. With your finger, push down on the drive belt, midway between the pulleys (Figure 51).

Note: Check the tension of all 3 drive belts.

C. Each belt should deflect approximately 5 mm at 2 kg (0.19 inch at 4.2 lb) from the straight edge (Figure 51). If the belt tension is too low or too high, adjust the belt tension; refer to Adjusting the Drive Belt Tension (page 35).

6. Install the belt guard; refer to Installing the Belt Guard (page 35).
7. Install the spark plug wire pushing the wire onto the terminal of the plug.

Installing the Belt Guard

1. Align the belt guard over the drive belts and pulleys and lower it to the base of the machine.
2. Slide the guard back so that the rear flange of the guard is underneath the bolt heads at the rear mounting points of the guard.
3. Secure the guard at the front mounting points with the bolts removed during step 5 in Removing the Belt Guard (page 33)
4. Tighten the bolts that secure the belt guard to the base of the machine at the rear mounting points.

Adjusting the Drive Belt Tension

1. Remove the belt guard; refer to Removing the Belt Guard (page 33).
2. Loosen the engine mounting hardware as follows:
   - **Model 68045**
     A. Elevate the blade to its highest position.
     B. Loosen the bolts, washers, and nuts that secure the engine to the base of the machine (Figure 52).

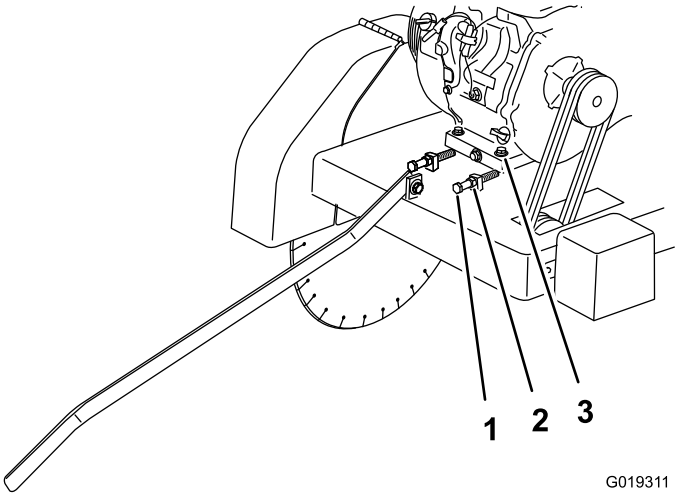


Figure 52
Belt Tensioning (Model 68045)

1. Tension bolt
2. Jam nut
3. Bolt and nut

Note: The nuts and washers that secure the motor are located at the bottom side of the base of the machine.

- **Model 68046**—Loosen the bolts and washers that secure the engine-deck plate to the base of the machine (Figure 53).

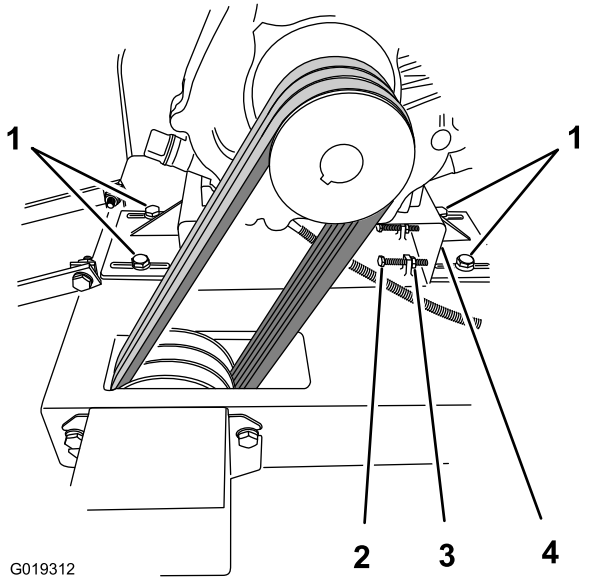


Figure 53
Belt Tensioning (Model 68046)

1. Bolt
2. Tension bolt
3. Jam nut
4. Engine-deck plate

3. Loosen the jam nuts that secure the tension bolts (Figure 52 and Figure 53).
4. Adjust the belt tension as follows:
   - To **increase** the belt tension, rotate the tension bolt clockwise.
   - To **reduce** the belt tension, rotate the tension bolt counterclockwise and slide the engine forward.
5. Check the belt tension; refer to step 5 in Checking the Pulleys and Drive Belts (page 34).

   Note: Ensure that the pulleys are aligned and the engine is parallel with the frame (not angled toward the side).
6. Tighten the jam nuts for the tension bolts.
7. Tighten the engine mounting bolts as follows:
   A. **Model 68045**—Tighten the bolts and nuts that secure the engine to the base of the machine to 48 N-m (35 ft-lb)(Figure 52).
   B. **Model 68046**—Tighten the bolts that secure the engine deck plate to the base of the machine to 48 N-m (35 ft-lb)(Figure 53).
8. Install the belt guard; refer to Installing the Belt Guard (page 35).
9. Install the spark plug wire pushing the wire onto the terminal of the plug.

Aligning the Pulleys

1. Remove the belt guard; refer to Removing the Belt Guard (page 33).
2. Reduce the belt tension; refer to adjust the belt tension in step 4 in Adjusting the Drive Belt Tension (page 35).
3. If the arbor pulley is misaligned in the opening of the base of the machine or loose on the arbor (Figure 49), do the following:
   A. Pull the recoil start handle of the engine until the setscrew hole in the center V-belt groove of the pulley is accessible (Figure 54).

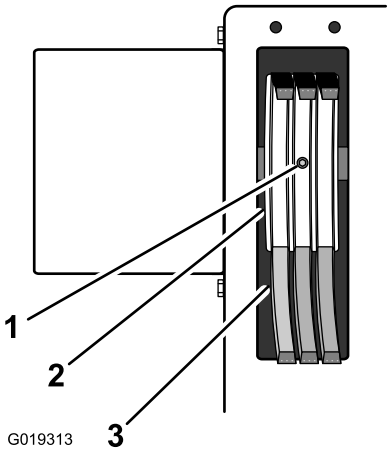


Figure 54
Pulley Set Screw

1. Set screw and center V-belt groove
2. Arbor pulley
3. Belt

   B. Loosen the set screw (Figure 54).
   C. Center the alignment of arbor pulley in the opening of the base of the machine by prying between the opening in the base and ends of pulley with a screwdriver.
   D. Tighten the setscrew (Figure 54).
4. Place a straight edge across the face of the drive-shaft pulley and the arbor pulley. Both pulleys must be aligned flush with the straight edge (Figure 55).

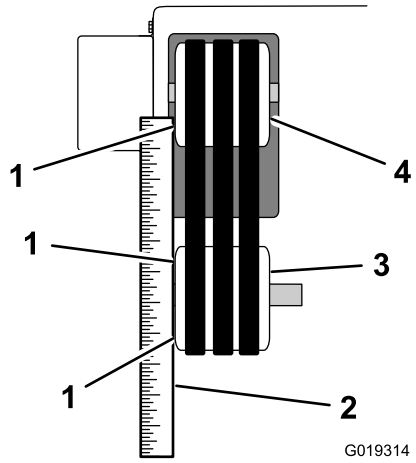


Figure 55
Drive-shaft Pulley Alignment

1. Alignment points
2. Straight edge
3. Drive-shaft pulley
4. Arbor pulley

5. If the drive-shaft pulley is not aligned do the following:
   A. Pull the recoil start handle of the engine until the setscrew hole in the center V-belt groove of the drive-shaft pulley is accessible.
   B. Loosen the setscrew.
   C. Using a soft-face mallet, tap the pulley left or right along the drive shaft until the drive-shaft pulley and the arbor pulley are aligned to the straight edge (Figure 55).
   D. Tighten the setscrew.
   E. Increase the belt tension; refer to step 4 in Adjusting the Drive Belt Tension (page 35) and step 5 in Checking the Pulleys and Drive Belts (page 34)
6. Install the belt guard; refer to Installing the Belt Guard (page 35).
7. Install the spark plug wire pushing the wire onto the terminal of the plug.

Replacing the Drive Belts

1. Elevate the blade to its highest position; refer to Adjusting the Cutting Depth (page 14).
2. If installed, remove the saw blade; refer to Removing the Blade (page 12).
3. Remove the belt guard; refer to Removing the Belt Guard (page 33).
4. Loosen the engine mounting hardware as described in step 2 of Adjusting the Drive Belt Tension (page 35).
5. Loosen the belt tension bolt and jam nut, slide the engine forward to loosen belts; refer to Figure 52 and Figure 53.
6. Remove the belts as follows:
   A. While supporting the arbor shaft, remove the bolts, washers, and nuts that secure the arbor bearing blocks to the bottom side of the base of the machine (Figure 56).

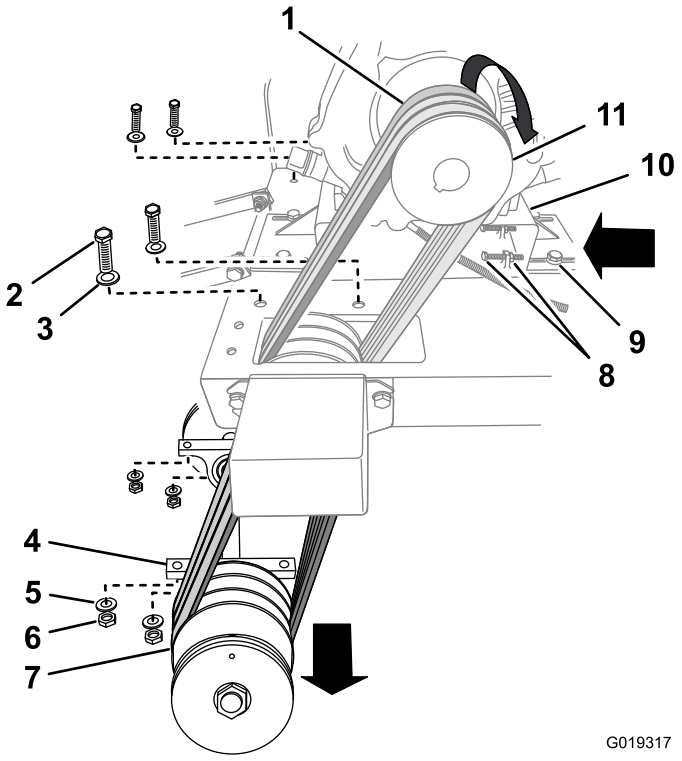


Figure 56

   B. Slip the belts over the drive shaft pulley (Figure 56).
   C. Remove the arbor and belts from the base of the machine (Figure 56).
   D. Remove and discard the damaged or unserviceable belts from the arbor pulley.
7. Install the arbor and belts as follows:
   A. Align the new belts (or combination of new and serviceable belts) over the arbor pulley (Figure 56).
   B. From beneath the base of the machine, route the belts through the arbor pulley opening and align the arbor bearing blocks to the mounting holes in the base (Figure 56).
   C. Secure the arbor bearing blocks to the base with the bolts, washers and nuts removed in step 6 - A.
   D. Slip the belts over the drive-shaft pulley (Figure 56).
8. Check the alignment of the pulleys; refer to Aligning the Pulleys (page 36).
9. Tension the belts; refer to Adjusting the Drive Belt Tension (page 35).
10. Install the belt guard; refer to Installing the Belt Guard (page 35).

Saw Blade Maintenance

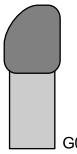
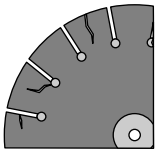
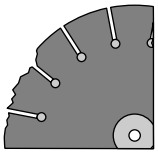
Checking the Condition and Function

Service Interval: Before each use or daily—Check the condition of the saw blade condition for wear and damage.

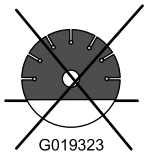
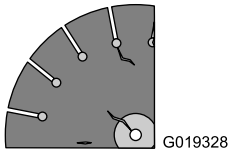
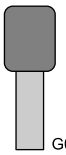
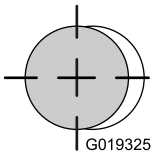
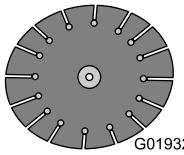
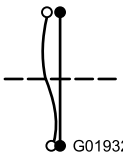
Important: The wear and loss of the saw-blade segments can significantly impair the efficiency and performance of the machine. Therefore, it is important to make frequent checks of the condition of all of segments and replace the blade if the segments are worn excessively or damaged.

Note: Among the most critical elements of the machine is the saw blade. They are also the most subject to wear and damage. In the course of flat sawing a project-site surface, they not only make contact with the concrete, asphalt, or both, they also encounter embedded metal objects, such as concrete wire mesh, rebar, and anchor bolts.

Blade Troubleshooting Table

Symptom	Possible Cause	Solution
Uneven Segment Wear  G019320	**Wet Cutting:** insufficient water (usually on one side of the blade).	• Flush the water system. • Check the water flow to both sides of the blade.
	Equipment defects.	Replace bad bearings and/or worn arbor. Align arbor to the base of the machine.
	Cutting head misaligned.	Check that the saw blade alignment is square vertically and horizontally.
Cracked Segments  G019321	Bond / matrix is too hard for material being cut.	Install the proper blade per the blade manufacturer recommendation.
Segment Loss  G019329	Blade overheating due to inadequate coolant (water or air).	• **Wet Cutting:** Check the water lines to make sure flow is 7.5–19 liter/minute (2–5 gallon/minute) on both sides of the blade, and that there are no blockages. • **Dry Cutting:** Run the blade free of the cut periodically to air cool.
	Core is worn from undercutting.	See the troubleshooting symptom for blade core undercutting.
	Bond / matrix is too hard for material being cut.	Install the proper blade per the blade manufacturer recommendation.
	Blade is cutting out-of-round, causing a pounding motion.	Replace bad bearings; align the arbor; replace worn blade collars.
	Blade flanges are not the same diameter and/or the flanges are damaged causing blade misalignment.	Replace the blade collar that are not identical in diameter of that are damaged.
Blade Wobbles  G019322	Blade mounted on a damaged or worn machine.	Check for bad arbor bearings, loose bearing block, or bent arbor.
	Blade operating improper RPM.	Use a tachometer to set the blade RPM to match the specified RPM of the blade.
	Blade collars are not the same diameter.	Replace the collars that are not identical in diameter or that are damaged.
	Blade is bent as a result of dropping twisting.	**Do not use** the bent blade. Contact the blade manufacturer.

Blade Troubleshooting Table (cont'd.)

Blade Will Not Cut  G019323	Bond / matrix is too hard for material being cut.	Install the proper blade per the blade manufacturer recommendation.
	Blade has become dull.	Dress or sharpen by cutting softer abrasive material to expose the diamonds.
	Failure to initially break-in a new blade on the specific material being cut.	Beak-in the blade on the material to be cut.
Cracked Core  G019328	Bond / matrix is too hard for material being cut.	Install the proper blade per the blade manufacturer recommendation.
	Excessive cutting pressure; jamming or twisting the blade in the cut.	Machine operator should use steady even feed pressure and be careful to cut in a straight line.
	Blade overheating due to inadequate coolant (water or air).	• **Wet Cutting:** Check the water lines to make sure flow is 7.5–19 liter/minute (2–5 gallon/minute) on both sides of the blade, and that there are no blockages. • **Dry Cutting:** Run the blade free of the cut periodically to air cool.
Undercutting the Core  G019324	Abrasive wearing off the core faster than the segments.	• Use water to flush the fines that are generated during cutting. • Use a blade with a wear-retardant core.
Arbor Hole Out-of-round  G019325	Blade collar is not properly tightened.	Wrench tighten the arbor nut and make certain the blade is adequately secure to prevent rotation
	Collars are dirty.	Clean the inner and outer collars. Replace if worn or damaged.
	Blade is not properly installed.	Tighten the arbor nut and check that the drive pin is functioning properly.
Blade Worn Out-of-round  G019326	Arbor bearings worn.	Replace the arbor bearings and/or arbor as required.
	Surges occur because engine is not properly adjusted.	Adjust the engine according to the engine *Owner's Manual*.
	Blade arbor hole is damaged from blade being incorrectly installed.	Replace the worn arbor and/or collars. Replace the worn blade.
	Blade is slipping on the shaft.	Tighten the arbor nut and collars, and check that the drive pin is functioning properly.
	Bond / matrix is too hard for material being cut.	Install the proper blade per the blade manufacturer recommendation.
Loss of Blade Tension  G019327	Blade used is misaligned on the machine.	Check that the saw blade alignment is square vertically and horizontally.
	Bond / matrix is too hard for material being cut.	Use a blade with a softer bond/matrix.
	The core of the blade is overheating.	Check the water lines and the water flow and distribution.
	The blade is running at the incorrect RPM.	Use a tachometer to set the blade RPM to match the specified RPM of the blade.
	The blade is incorrectly mounted between the collars.	• Check that the drive pin is functioning properly. • Tighten the arbor nut.
	The blade collars are undersized or not the same diameter.	Replace the collars that are not the recommended size or are not identical in diameter.

Cleaning

Cleaning the Machine

Regular cleaning and washing will increase the life span of the machine. Clean the machine after each use, before the dirt hardens.

Ensure that the fuel tank cap and oil cap/dipstick are secure to avoid getting water in the tank.

Use care when using a high-pressure sprayer because it can damage warning decals, instruction signs, and the engine

Important: Lubricate the arbor bearings after cleaning; refer to Greasing the Machine (page 27).

Storage

Storing the Machine

For storage over 30 days, prepare the unit as follows:

1. Remove dirt and grime from the external parts of the entire unit, especially the engine. Clean dirt and sawdust chips from the outside of the engine cylinder head fins and blower housing.

   Important: You can wash the unit with mild detergent and water.

2. Condition the fuel system as follows:

   A. Add a petroleum based stabilizer/conditioner to fuel in the tank. Follow mixing instructions from stabilizer manufacturer. (1 oz. per US gallon). **Do not** use an alcohol based stabilizer (ethanol or methanol).

   Important: Do not store stabilizer/conditioned gasoline over 90 days.

   Note: Fuel stabilizer/conditioner is most effective when mixed with fresh gasoline and used at all times.

   B. Run the engine to distribute conditioned fuel through the fuel system (5 minutes).

   C. Stop the engine, allow it to cool, and drain the fuel tank using a pump type siphon. Dispose of fuel properly; recycle as per local codes.

   D. Start the engine and run it until it stops.

   E. Choke the engine.

   F. Start and run the engine until it will not start again.

3. Clean the sediment cup; refer to Cleaning the Sediment Cup (page 30).
4. Service the air cleaner; refer to Servicing the Air Filter (page 28).
5. Change the engine crankcase oil; refer to Changing the Engine Oil (page 29).
6. Remove the spark plug and check the condition; refer to Servicing the Spark Plug (page 31).
7. Condition the engine as follows:

   A. Remove the spark plug and pour two tablespoons of engine oil into the spark plug hole; refer to Removing the Spark Plug (page 31).

   B. Pull the recoil start handle slowly to crank the engine and distribute the oil inside the cylinder.

   C. Install the spark plug; refer to Installing the Spark Plug (page 32).

   Note: Do not install the wire on the spark plug.

8. Grease the bearings for the arbor and rear wheel and lubricate the threads of the blade elevation

screw; refer to Greasing the Machine (page 27) and Lubricate the Elevation Screw (page 27).

9. Check and tighten all bolts, nuts, and screws. Repair or replace any part that is damaged.
10. Paint all scratched or bare metal surfaces. Paint is available from your Authorized Service Dealer.
11. Store the unit in a clean, dry garage or storage area.
12. Cover the unit to protect it and keep it clean.

Troubleshooting

Note: Saws with the Honda GX series engines are equipped with the Oil Alert® System.

Oil Alert® is a registered trade mark of HONDA GIKEN KOGYO KABUSHIKI KAISHA CORPORATION.

Problem	Possible Cause	Corrective Action
The engine will not start.	1. On the operator panel, the engine switch is in the Stop position	1. Press the engine switch to the Run position.
	2. The fuel valve is Off.	2. Move the fuel-valve lever to the On position.
	3. The choke is closed	3. Open the choke when starting a hot engine.
	4. The choke is open.	4. Close the choke when starting a cold engine.
	5. On the engine, On/Off switch is in the Off position.	5. Rotate the switch to the On position.
	6. The engine oil level is low (Oil Alert model engines)	6. Fill with the recommended oil to the proper level.
	7. The fuel tank is empty.	7. Fill tank with fresh fuel.
	8. Bad fuel: engine stored without treating or draining the gasoline, or refueled with bad gasoline.	8. Drain the fuel tank and carburetor. Refuel with fresh gasoline.
	9. The spark plug is fouled or improperly gapped.	9. Gap or replace the spark plug.
	10. The spark plug is wet with fuel (flooded engine).	10. Remove the spark plug, dry it, and install the plug. Start the engine with the throttle in the MAX position.
	11. The spark plug wire is loose or disconnected.	11. Remove the spark plug wire, clean the spark plug terminal and the terminal socket in boot of the spark plug wire, and reinstall the spark plug wire.
The engine lacks power or runs rough.	1. The air filter is restricted.	1. Clean or replace the air filter element(s).
	2. Bad fuel: engine stored without treating or draining the gasoline, or refueled with bad gasoline.	2. Drain the fuel tank and carburetor. Refuel with fresh gasoline.
	3. There is water or contaminants in the fuel.	3. Drain the fuel tank and carburetor. Refuel with fresh gasoline.
	4. The fuel line is restricted.	4. Clean the fuel filter and sediment cup.
	5. The choke is left on.	5. Open the choke.
	6. The spark plugs are worn or have buildup on the electrodes.	6. Check the electrode gap and clean or replace the spark plug.
	7. Too much oil in the engine crankcase.	7. Drain the oil to the proper level.
The belt slips or comes off the pulleys.	1. The belt tension is insufficient.	1. Adjust the belt tension.
	2. The belt is worn.	2. Replace the belt.
	3. The pulley(s) are worn.	3. Contact your Authorized Service Dealer.
	4. The pulley(s) are misaligned.	4. Align the pulley(s).

Notes:

Concrete, Masonry, and Compaction Equipment

The Toro Warranty

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 Concrete, Masonry, and Compaction Equipment 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
Concrete Mixers	1 year
• Spindle Bearings	Lifetime* (original owner only)
Mortar Mixers	1 year
• Drum Bearings and Seals	Lifetime* (original owner only)
Forward Plate Compactors	2 years
Reversible Plates	1 year
Rammer Compactors	2 years
Mud Buggy	1 year
Vibrating Trench Roller	2 years
Concrete Saws	1 year
Masonry Saws	1 year
Power Trowels	1 year
Screeds	1 year
Concrete Vibrators	1 year

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

*Lifetime Warranty - If the bearing(s) or seal(s) on your mixer fail, it will be replaced under warranty, at no cost for parts or labor.

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. 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: 800-888-9926

**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 clam 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, wipers, spark plugs, tires, filters, gaskets, wear plates, seals, O-rings, drive chains, clutches.
- 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.