



VIB-2.5BP Concrete Vibrator

Model No. 68043—Serial No. 313000001 and Up

Operator's Manual

Introduction

This concrete vibrator is designed for vibrating and consolidating concrete products by removing air pockets and voids.

Read this information carefully to learn how to operate and maintain your product properly and to avoid injury and product damage. You are responsible for operating the product properly and safely.

You may contact Toro directly at www.Toro.com for product and accessory information, help finding a dealer, or to register your product.

Whenever you need service, genuine Toro parts, or additional information, contact an Authorized Service Dealer or Toro Customer Service and have the model and serial numbers of your product ready. Figure 1 identifies the location of the model and serial numbers on the product. Write the numbers in the space provided.

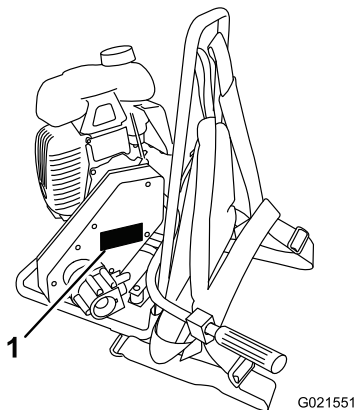


Figure 1

1. Model and serial number location

Model No. _____
Serial No. _____

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



Figure 2

1. Safety alert symbol

This manual uses 2 words to highlight information.

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

⚠ 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.

This spark ignition system complies with Canadian ICES-002.

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

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

Important: It is a violation of California Public Resource Code Section 4442 to use or operate the engine on any forest-covered, brush-covered, or grass-covered land without a spark arrester muffler maintained in working order, or the engine constricted, equipped, and maintained for the prevention of fire. Other states or federal areas may have similar laws.

The enclosed *Engine Owner's Manual* is supplied for information regarding the US Environmental Protection Agency (EPA) and the California Emission Control



Regulation of emission systems, maintenance, and warranty. Replacements may be ordered through the engine manufacturer.

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Safety

Improperly using or maintaining the machine can result in injury. To reduce the potential for injury, comply with these safety instructions and always pay attention to the safety alert symbol (Figure 2) 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

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.

Training

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

Preparation

Become familiar with the safe operation of the equipment, operator controls, and safety signs.

- Use only accessories and attachments approved by the manufacturer.
- Wear personal protective equipment and appropriate clothing including:
 - safety glasses
 - hearing protection
 - safety shoes
 - long pants
 - shirt with long sleeves that are tight at the wrists
 - tight-fitting gloves without drawstrings or loose cuffs
- Secure long hair, loose clothing, or jewelry that may get tangled in moving parts.
- Operating the equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating the machine.
- Use extra care when handling fuels. They are flammable and the vapors are explosive. Use the following practices when handling fuel:
 - Use only an approved fuel container.
 - Never remove the fuel cap or add fuel with the engine running.
 - Allow the engine to cool before refueling.
 - Do not smoke.

- Never refuel or drain the machine indoors.
- Replace the fuel cap and tighten it securely.
- Keep the container nozzle in contact with the tank during filling.
- Never fill a container while it is inside a vehicle, trunk, pick-up bed, or any surface other than the ground.
- Never store the machine or fuel container inside where there is an open flame, such as near a water heater or furnace.
- If fuel is spilled, wipe it off the engine and equipment.

Operation

- Never run an engine in an enclosed or poorly ventilated area.
- Only operate the machine in good lighting conditions.
- Before starting the machine, make sure that there are no persons or obstacles near or under the machine.
- Shut off the engine before leaving the machine for any reason. Never leave a running machine unattended. Always stop the engine and verify that all moving parts have stopped.
- Avoid prolonged breathing of exhaust fumes. Engine exhaust fumes can cause sickness or death.
- Do not operate the machine under the influence of alcohol or drugs.
- Do not touch parts which may be hot from operation. Allow them to cool before attempting to maintain, adjust, or service the machine.
- Ensure that all the guards and shields are securely in place before operating the machine.
- If the machine strikes a foreign object or if the machine starts making an unusual noise or vibration, stop the engine. Wait for all moving parts to come to a complete stop and cool. Vibration is generally a warning of trouble. Inspect for clogging or damage. Clean and repair and/or replace damaged parts.
- Do not change the engine governor setting or overspeed the engine.
- Lightning can cause severe injury or death. If you see lightning or hear thunder in the area, do not operate the machine; seek shelter.

Maintenance and Storage

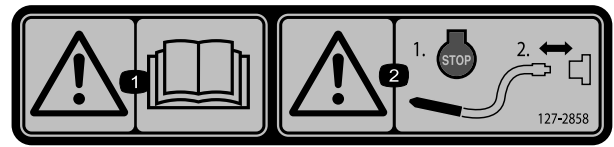
- Before performing maintenance, do the following:
 - Place the machine on level ground.
 - Stop the engine. Wait for all movement to stop before adjusting, cleaning, or repairing the machine.
 - Let the engine cool before performing maintenance or storing the machine.
 - Disengage all power and operation controls.
- Do not lubricate, service, or repair the machine while it is running.
- Keep equipment materials clear from the muffler and engine to help prevent fires. Clean up any oil or fuel spillage.
- Never allow untrained personnel to service the machine.
- Keep hands, feet, and clothing 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.
- Remove any buildup of grease, oil, or debris from the machine.
- Stop and inspect the machine if a foreign object causes an obstruction. Make any necessary repairs before starting the machine.
- Do not tamper with safety devices.
- Keep all nuts, bolts, screws, and hose clamps securely tightened. Keep equipment in good condition.
- Use only genuine Toro replacement parts to ensure that the original standards are maintained.

Safety and Instructional Decals

Important: Safety and instruction decals are located near areas of potential danger. Replace damaged decals.

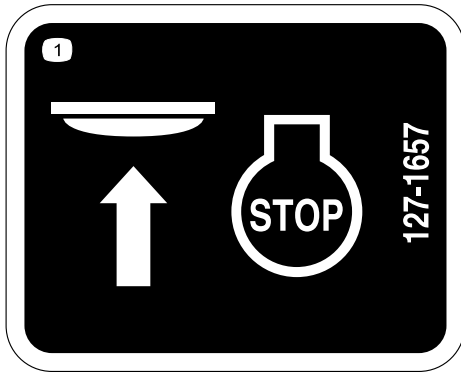
CALIFORNIA SPARK ARRESTER WARNING
 Operation of this equipment may create sparks that can start fires around dry vegetation. A spark arrester may be required. The operator should contact local fire agencies for laws or regulations relating to fire prevention requirements. 117-2718

117-2718



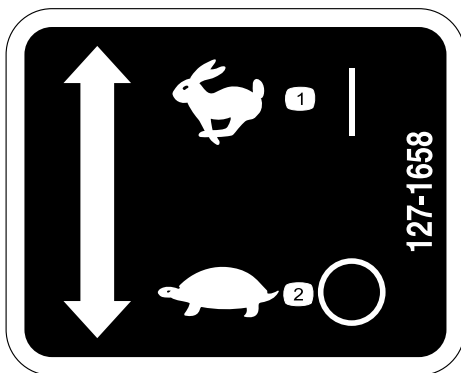
127-2858

1. Warning—read the *Operator's Manual*.
2. Warning—1) Stop the engine; 2) Disconnect the shaft.



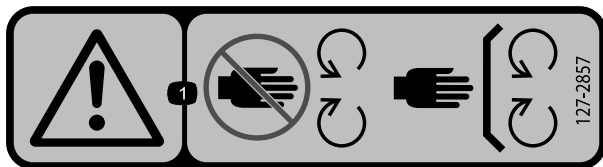
127-1657

1. Push to stop the engine.



127-1658

1. Fast—on
2. Slow—off



127-2857

1. Warning—keep away from moving parts; keep all guards and safeties in place.

Setup

1

Filling the Engine with Oil

No Parts Required

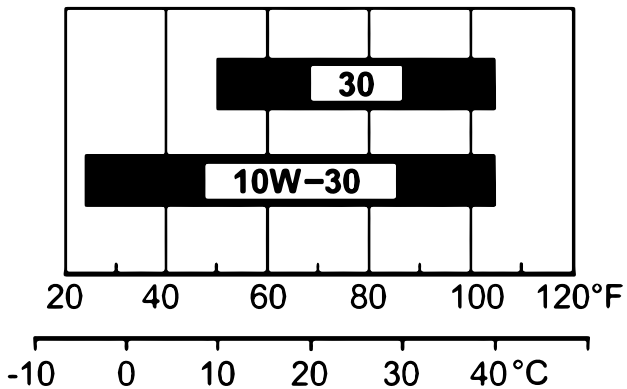
Procedure

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

Crankcase capacity: 0.25 L (0.26 US qt)

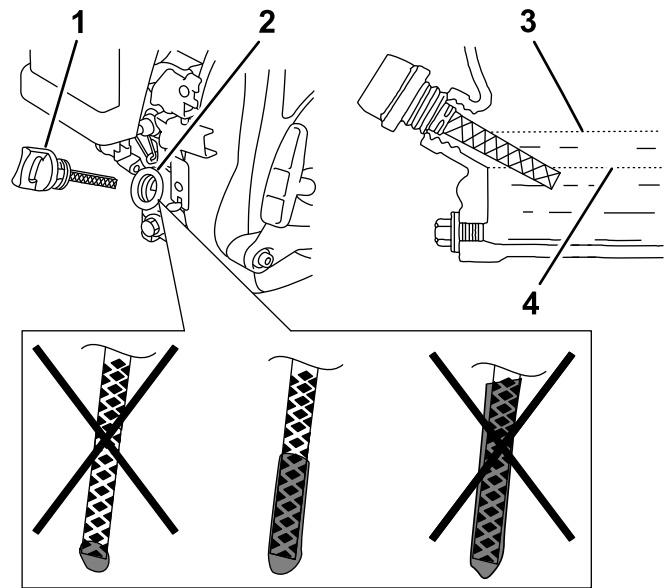
Important: If the oil level in the crankcase is too low or too high and you run the engine, you may damage the engine. This type of damage is not covered by the warranty.

Note: Use SAE 10W-30 for general use. You can use SAE 30 when the average temperature in your area is within the indicated range (Figure 3).



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Figure 3



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Figure 4

1. Oil fill hole
2. Dipstick
3. Oil-level upper limit
4. Oil-level lower limit

2. Replace and secure the dipstick.
3. Wipe up any spilled oil.

1. Remove the dipstick (Figure 4) and slowly pour oil into the fill hole until the oil reaches the upper-limit mark (bottom edge of the oil-fill hole) on the dipstick.

2

Installing the Throttle Arm

Parts needed for this procedure:

1	Throttle arm
1	Bolt
1	Locknut

Procedure

1. Align the inner core of the handle with the core adapter on the throttle control box (Figure 5), and insert it fully.

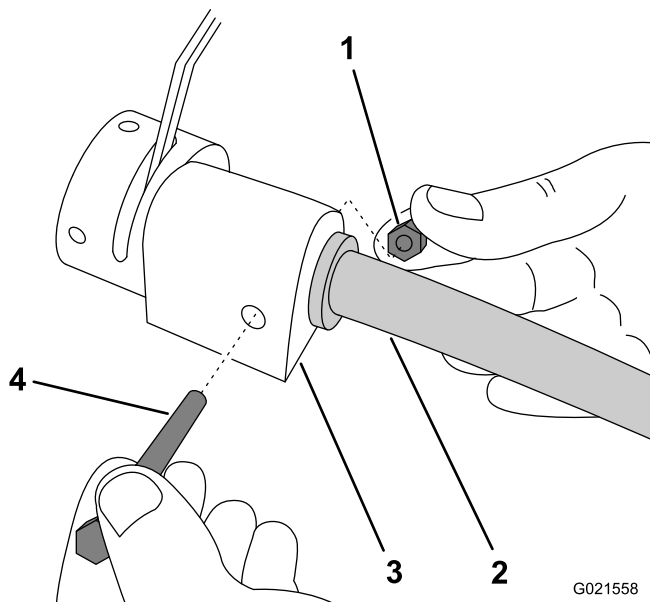


Figure 5

1. Locknut
2. Throttle arm
3. Throttle control box
4. Bolt

Note: Ensure that the flat area on the tube is on the bottom.

2. Insert the bolt through the throttle control box, and secure it with the locknut (Figure 5).
3. Connect the male electrical connector from the engine switch on the throttle arm to the female connector on the engine.

Note: Ensure that the connectors are connected securely.

Product Overview

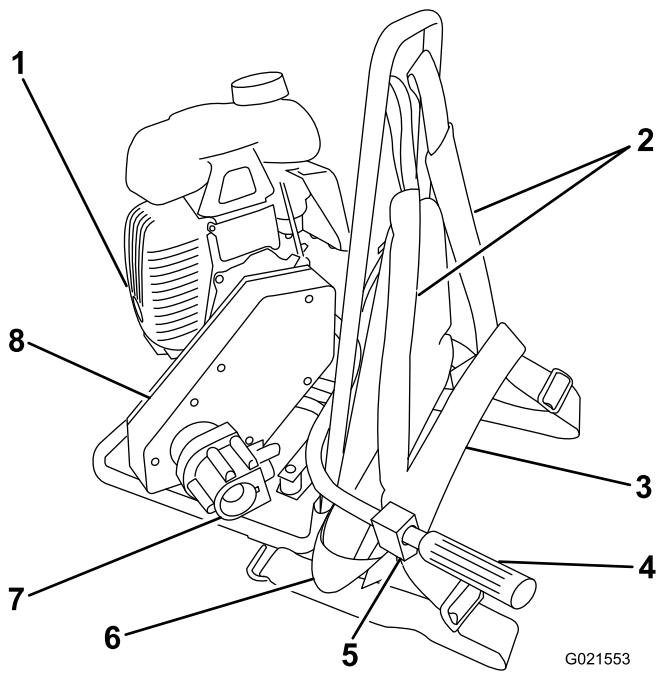


Figure 6

- | | |
|--------------------|-----------------------|
| 1. Muffler | 5. Engine stop button |
| 2. Shoulder straps | 6. Waist strap |
| 3. Chest strap | 7. Shaft coupling |
| 4. Throttle grip | 8. Belt guard |

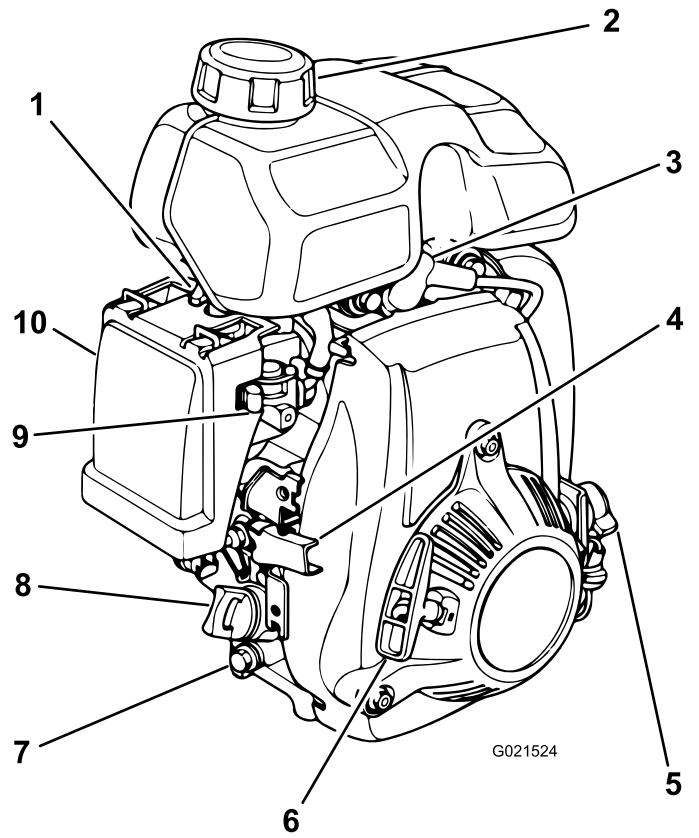


Figure 7

- | | |
|--------------------|------------------------|
| 1. Choke lever | 6. Recoil-start handle |
| 2. Fuel cap | 7. Oil drain plug |
| 3. Spark-plug wire | 8. Dipstick |
| 4. Throttle | 9. Fuel valve |
| 5. On/Off switch | 10. Air cleaner |

Controls

Fuel Valve

The fuel valve (Figure 8) is located to the right of and below the choke lever. Move the lever for the fuel valve to the On position before attempting to start the engine. When you have finished using the machine, stop the engine and move the fuel valve lever to the Off position.

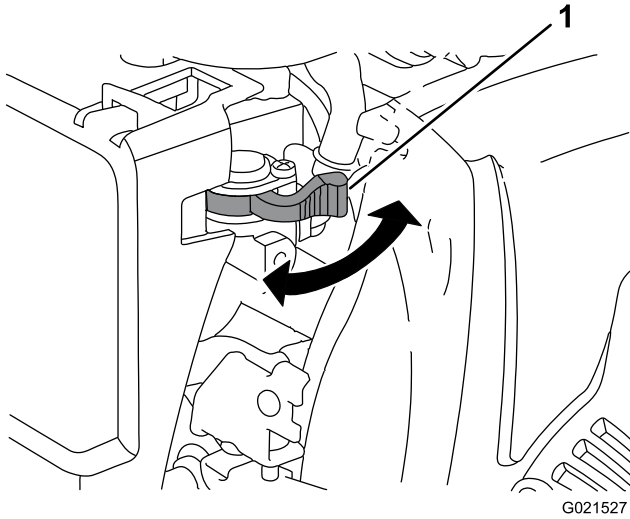


Figure 8

1. Fuel valve

Choke Lever

Use the choke lever (Figure 9) to start a cold engine. Before pulling the recoil-start handle, move the choke lever to the closed position (**right**). Once the engine is running, move the choke lever to the open position (**left**). Do not use the choke if the engine is already warmed up or the air temperature is high.

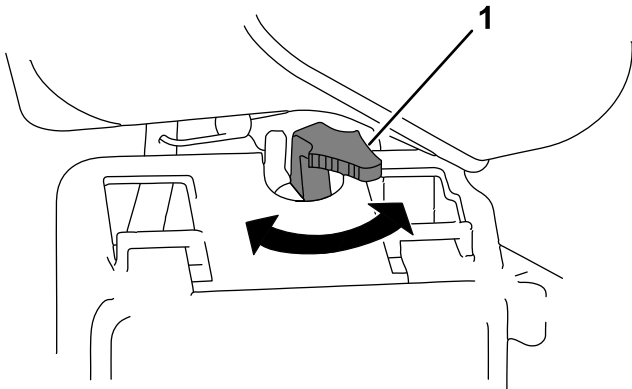


Figure 9

1. Choke lever

Throttle Grip

The throttle lever (Figure 10) controls the speed (rpm) of the engine. It is located at the end of the throttle arm. It sets the engine speed and therefore can increase and decrease the vibration speed of the head. For best performance, set this control to the fast position when using the machine.

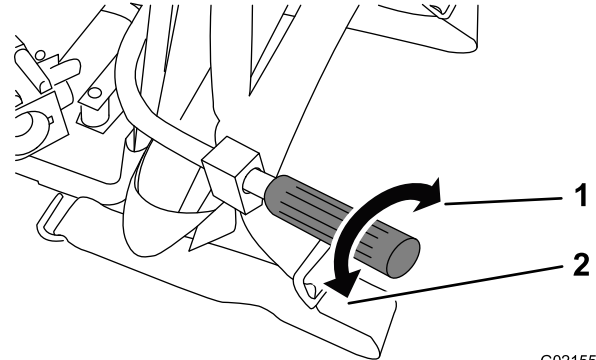


Figure 10

1. Slow (idle)
2. Fast

Engine On/Off Switch

The On/Off switch (Figure 11) allows the operator of the machine to start and stop the engine. Rotate the On/Off switch to the On position (clockwise) to start and run the engine. Rotate the On/Off switch to the Off position (counterclockwise) to stop the engine.

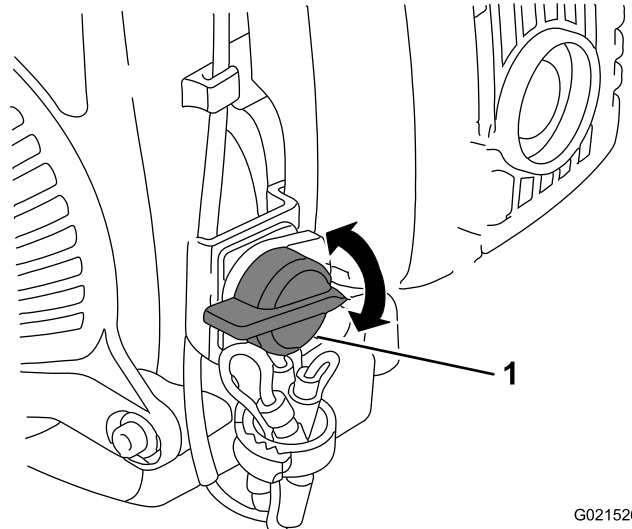


Figure 11

1. On/Off switch

Recoil-start Handle

To start the engine, pull the recoil-start handle (Figure 7) quickly. Ensure that the engine controls described above are all set correctly.

Engine Stop Button

The engine stop button (Figure 12) is located under the throttle arm and near the throttle grip. Press it if you need to stop the engine quickly.

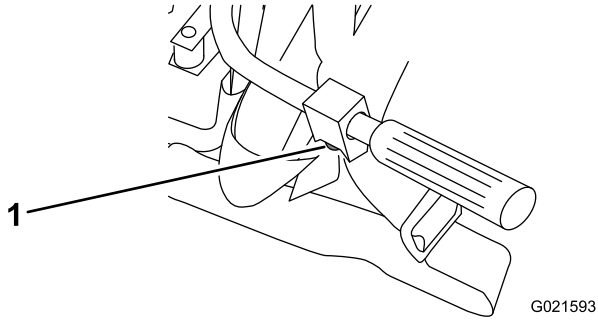


Figure 12

1. Engine stop button

Oil-level Switch

The oil-level switch is located inside the engine, and it will not allow the engine to run when the oil level is below the safe operating limit.

Specifications

Weight	Length	Width	Height
5.5 kg (12.1 lb)	33 cm (13 inches)	34.9 cm (14 inches)	58.4 cm (23 inches)

Operation

Read the Instruction Manual



Figure 13

Symbol located on the non-serviceable serial-number plate

1. Warning – To reduce the risk of injury, user must read and understand the instruction manual.

Attachments/Accessories

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

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 it contains a fuel stabilizer.
- Do not add oil to gasoline.

⚠ DANGER

In certain conditions, fuel is extremely flammable and highly explosive. A fire or explosion from fuel 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 fuel that spills.
- Never fill the fuel tank inside an enclosed trailer.
- Do not fill the fuel tank completely full. Add fuel to the fuel tank until the level is no higher than the screen on the filter in the fuel tank. This empty space in the tank allows the fuel to expand.
- Never smoke when handling fuel, and stay away from an open flame or where fuel fumes may be ignited by a spark.
- Store fuel in an approved container and keep it out of the reach of children. Never buy more than a 30-day supply of fuel.
- Do not operate without the 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 fuel vapors. A fire or explosion from fuel can burn you and others and can damage property.

- Always place fuel containers on the ground away from your vehicle before filling.
- Do not fill fuel 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 fuel-powered equipment from the truck or trailer and fuel the equipment on the ground. If this is not possible, then fuel such equipment on a truck or trailer from a portable container rather than from a fuel dispenser nozzle.
- If you must use a fuel dispenser nozzle, keep the nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete.

⚠ WARNING

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

- Avoid prolonged breathing of vapors.
- Keep your face away from the nozzle and the fuel tank or conditioner opening.
- Keep fuel away from your eyes and skin.

Important: Do not mix oil with fuel.

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 Fuel Stabilizer/Conditioner

Use a fuel stabilizer/conditioner in the machine to keep the fuel fresh during storage of 90 days or less. If you are storing the machine for longer, drain the fuel tank; refer to Draining the Fuel Tank and Carburetor (page 20).

Important: Do not use fuel additives containing methanol or ethanol.

Add the correct amount of fuel stabilizer/conditioner to the fuel, and follow the directions of the manufacturer.

Note: Fuel stabilizer/conditioner is most effective when mixed with fresh fuel. To minimize the chance of varnish deposits in the fuel system, use fuel stabilizer at all times.

Filling the Fuel Tank

Capacity: 0.77 L (0.20 US gallon)

1. Place the machine on a level surface, stop the engine, and allow the engine to cool; refer to Stopping the Engine (page 14).
2. Clean around the fuel cap, and remove it.

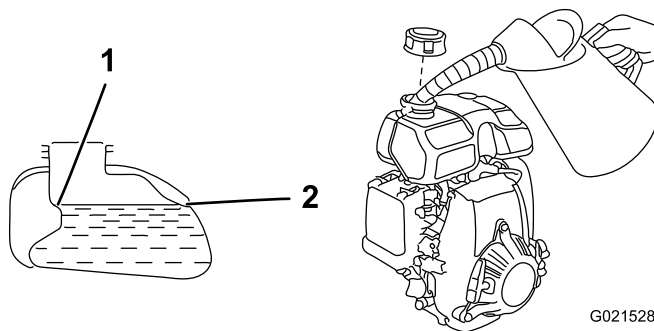


Figure 14

1. Fuel-level mark
2. Maximum fuel level

3. Add unleaded gasoline to the fuel tank, until the level is at the fuel-level mark, as shown in Figure 14.

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

4. Install the fuel cap securely (Figure 14).
5. Wipe up any fuel that may have spilled.

Checking the Engine Oil Level

Service Interval: Before each use or daily

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

Crankcase capacity: 0.25 L (0.26 US qt)

Important: If the oil level in the crankcase is too low or too high and you run the engine, you may damage the engine. This type of damage is not covered by the warranty.

Note: Use SAE 10W-30 for general use. You can use SAE 30 when the average temperature in your area is within the indicated range (Figure 15).

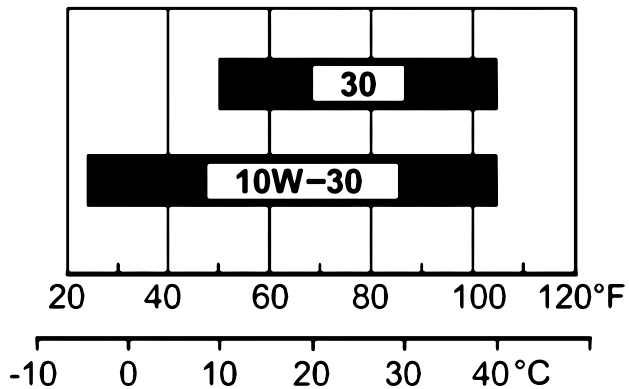
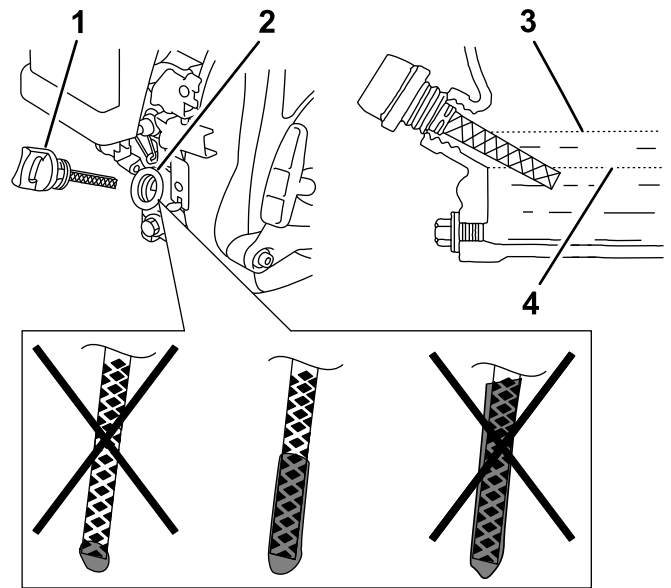


Figure 15

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1. Place the machine on a flat, level surface, and stop the engine; refer to Stopping the Engine (page 14).
2. Allow the engine to cool.
3. Clean around the dipstick.
4. Remove the dipstick and wipe the end clean (Figure 16).



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Figure 16

1. Fill port
2. Dipstick
3. Oil-level upper limit
4. Oil-level lower limit

5. Slide the dipstick fully into the fill port without threading it into the port (Figure 16).
6. Remove the dipstick and look at the end. If the engine oil level is low, slowly pour only enough oil into the fill port to raise the level to the Full mark on the dipstick (Figure 16).

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

7. Replace and secure the dipstick (Figure 16).

Installing the Head onto the Shaft

Note: The head and shaft are sold separately. There is a variety of sizes available from your Authorized Toro Dealer.

1. Hold the threaded end of the shaft in a pipe vise, and coat the threads of the shaft with a thread sealant to prevent water from entering the head (Figure 17).

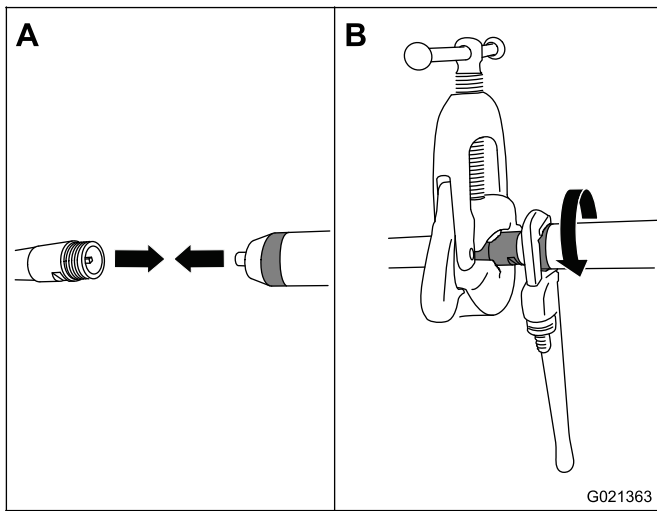


Figure 17

2. Bring the threaded end of the head together with the shaft, and thread them together by hand.

Note: The head and shaft have reverse, or left-hand threads.

3. Place a pipe wrench as close as possible to the end of the head, as shown in Figure 17B, to avoid loosening any parts of the head.

Important: If any parts of the head are loose, they could come off and get lost in the concrete.

4. Use the pipe wrench to turn the head counterclockwise to tighten it onto the shaft until it is tight.

Available Shafts

Shaft Model	Length
68117	0.91 m (3 ft)— narrow, for use with narrow head model 68110
68118	2.13 m (7 ft)— narrow, for use with narrow head model 68110
68119	3.05 m (10 ft)— narrow, for use with narrow head model 68110
68120	4.27 m (14 ft)— narrow, for use with narrow head model 68110
68121	0.91 m (3 ft)
68122	1.53 m (5 ft)
68123	2.13 m (7 ft)
68124	3.05 m (10 ft)
68125	4.27 m (14 ft)
68126	6.40 m (21 ft)

Available Heads

Head Model	Diameter	Length	Centrifugal Force (at 10,600 rpm)	Radius of Influence	Capacity	Operating Weight
68110 (requires a narrow shaft)	1.9 cm (3/4 inch)	30.5 cm (12 inches)	0.50 kN (112 lbf)	10.2 cm (4 inches)	3.06 cubic m/hour (4 cubic yards/hour)	1.36 kg (3 lb)
68111	2.5 cm (1 inch)	33.0 cm (13 inches)	0.81 kN (183 lbf)	12.7 cm (5 inches)	4.59 cubic m/hour (6 cubic yards/hour)	1.36 kg (3 lb)
68112	3.2 cm (1-1/4 inch)	33.0 cm (13 inches)	1.91 kN (430 lbf)	17.8 cm (7 inches)	6.12 cubic m/hour (8 cubic yards/hour)	1.81 kg (4 lb)
68113	3.8 cm (1-1/2 inch)	35.6 cm (14 inches)	3.38 kN (760 lbf)	35.6 cm (14 inches)	9.18 cubic m/hour (12 cubic yards/hour)	2.72 kg (6 lb)
68114	4.4 cm (1-3/4 inch)	35.6 cm (14 inches)	4.89 kN (1100 lbf)	45.7 cm (18 inches)	18.35 cubic m/hour (24 cubic yards/hour)	3.63 kg (8 lb)
68115	5.1 cm (2 inch)	35.6 cm (14 inches)	6.45 kN (1450 lbf)	55.9 cm (22 inches)	26.76 cubic m/hour (35 cubic yards/hour)	4.08 kg (9 lb)
68116	6.4 cm (2-1/2 inch)	33.0 cm (13 inches)	10.36 kN (2330 lbf)	63.5 cm (25 inches)	29.05 cubic m/hour (38 cubic yards/hour)	4.99 kg (11 lb)

Removing the Head from the Shaft

Remove the head from the shaft in the opposite order of installing it; refer to Installing the Head onto the Shaft (page 11).

Connecting the Shaft to the Machine

Note: The head and shaft are sold separately from the machine. There is a variety of sizes available from your Authorized Toro Dealer.

1. Ensure that the On/Off switch is in the Off position.
2. Rotate the coupling lever counterclockwise, and insert the shaft into the coupling (Figure 18 A).

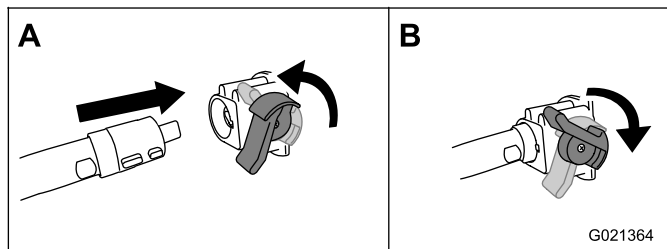


Figure 18

3. When the shaft is fully inserted, rotate the coupling lever clockwise, back to the original position (Figure 18 B).

Important: Ensure that the coupling lever locks the shaft in place so that the shaft does not become detached during operation.

Starting and Stopping the Engine

Starting the Engine

1. Place the machine on an elevated, flat, level surface.

Note: This will make it easier to get the machine onto your back after starting it.
2. Ensure that the machine, shaft, and head are securely attached.
3. Ensure that the throttle grip is in the Slow (idle) position and that the head is in a position where it will not injure anyone or cause damage to property.
4. Move the fuel valve lever to the On position; refer to Fuel Valve (page 8).
5. Position the choke lever as follows:
 - To start a cold engine, move the choke lever to the Closed position—all the way to the right (open); refer to Choke Lever (page 8).
 - To start a warm engine, move the choke lever to the Open position—all the way to the left (closed).
6. Rotate the engine On/Off switch to the On position; refer to Engine On/Off Switch (page 8).
7. Pull the recoil-start handle lightly until you feel resistance, then pull the handle briskly. Return the starter handle gently.

Note: If the choke lever is set to the Closed position to start the engine, gradually move it back toward the Open position as the engine warms up. If the engine stalls or hesitates, move the choke lever back toward the Closed position until the engine runs smooth. Allow the engine to warm up, then move the choke lever to the Open position; refer to Choke Lever (page 8).

Stopping the Engine

1. Move the throttle grip to the Idle position; refer to Throttle Grip (page 8).
2. Remove the machine from your back, and place it on a flat, level surface.
3. Move the fuel valve to the Off position; refer to Fuel Valve (page 8), and rotate the engine On/Off switch to the Off position; refer to Engine On/Off Switch (page 8).

Note: If you need to stop the engine immediately, use the engine stop button located under the throttle arm; refer to Engine Stop Button (page 9).

Using the Machine

Important: Do not operate the vibrator head out of the concrete mix for more than a few minutes. The wet concrete keeps the head at the proper operating temperature.

1. Start the engine; refer to Starting the Engine (page 14).
2. Using the shoulder, chest and waist straps, strap the machine to your back.

Note: Adjust the straps so that you are comfortable and the machine is secure.

3. While holding the flexible shaft in your left hand, use your right hand to control the throttle grip.

Note: The throttle grip has 2 positions: Slow (idle) and Fast.

4. Insert the vibrator head vertically into the concrete, and allow the weight of it to sink it to the desired depth.

Note: Forcing the vibrator head may cause it to become stuck between pieces of rebar.

5. Keep the vibrator head in place for 5 to 15 seconds, and then slowly lift it up.

Note: Allow about 15 seconds for moving the vibrator a 61 cm (2 foot) distance up and out of the concrete. Using a slight up and down movement will close the hole formed by the vibrator head.

6. Remove the vibrator quickly when it is near the top of the concrete.
7. Insert the vibrator at a distance 1.5 times the radius of influence away from the last insertion point, and repeat the procedure (Figure 19).

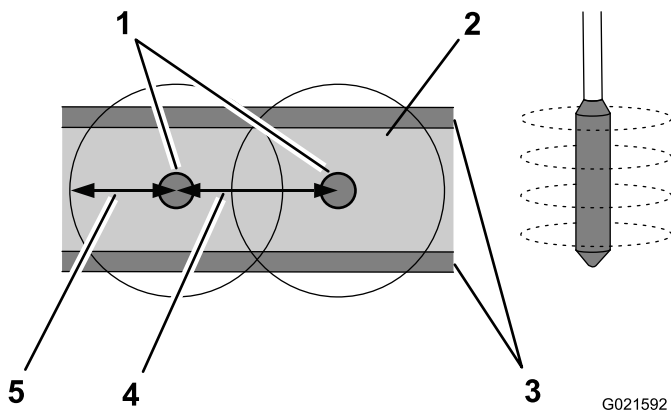


Figure 19

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- | | |
|---------------------|--------------------------------------|
| 1. Insertion points | 4. Distance between insertion points |
| 2. Concrete | 5. Radius of influence |
| 3. Forms | |

-
8. When you are finished using the machine, stop the engine, and wipe the machine clean.

Note: You can spray water on the head and shaft, but be careful not to damage the engine.

Operating Tips

- Match the vibrator power unit, shaft, and head to the job. Select the largest vibrator suitable for the job. Select the shortest shaft possible to do the job to assure maximum power to the vibrator head.
- For the highest efficiency, avoid making sharp bends in the flexible shaft.
- Do not use the vibrator to move the concrete laterally. Doing so will cause segregation. Use a shovel instead.
- Limit pours to 2 feet high; this will result in less resistance for air to escape.
- Allow the vibrator to penetrate 3 to 6 inches into the preceding layer to knit the 2 layers together, preventing lift lines.
- Flip the shaft around (so that the coupler end is at the head, and vice versa) periodically to extend the service life.

Note: The narrow shafts are not reversible; refer to Available Shafts (page 13).

Maintenance

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first 25 hours	<ul style="list-style-type: none"> • Change the engine oil.
Before each use or daily	<ul style="list-style-type: none"> • Check the engine oil level.
Every 25 hours	<ul style="list-style-type: none"> • Check the air cleaner for dirty, loose, or damaged parts, and clean or replace them if necessary.
Every 40 hours	<ul style="list-style-type: none"> • Lubricate the shaft with lithium-based grease.
Every 100 hours	<ul style="list-style-type: none"> • Replace the air-cleaner element (more frequently when operating the machine in dusty or dirty operating conditions). • Change the engine oil. • Check the spark plug. • Clean the spark arrester. • Inspect the belt and belt tension, and adjust or replace the belt as needed.
Every 300 hours	<ul style="list-style-type: none"> • Replace the spark plug.
Before storage	<ul style="list-style-type: none"> • Empty the fuel tank before repairs as directed and before annual storage.
Yearly	<ul style="list-style-type: none"> • Refer to your Engine Operator's Manual for any additional yearly maintenance procedures.
Yearly or before storage	<ul style="list-style-type: none"> • Drain the fuel tank and carburetor.

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

Preparing the Machine for Maintenance

1. Stop the engine and wait for all moving parts to stop.
2. Disconnect the spark-plug wire from the spark plug (Figure 20) before performing any maintenance procedure.

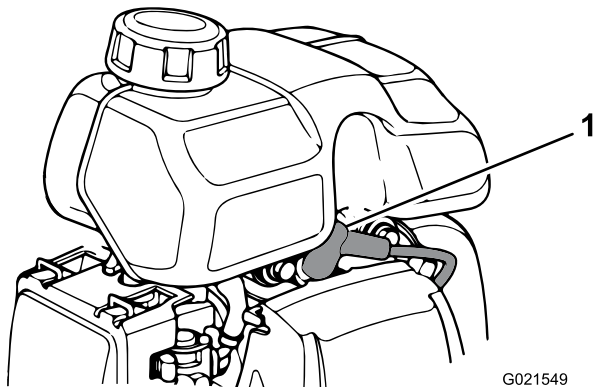


Figure 20

1. Spark-plug wire

⚠ WARNING

Tipping the machine may cause the fuel to leak. Gasoline is flammable and explosive and can cause personal injury.

Run the engine dry or remove the gasoline with a hand pump; never siphon.

Lubricating the Shaft

Service Interval: Every 40 hours—Lubricate the shaft with lithium-based grease.

Lubricate the flexible shaft to prevent dry spots that cause overheating.

1. Disconnect the flexible shaft from the vibrator head and the power unit.
2. Remove the inner core and wipe it clean (Figure 21A).

3. After performing the maintenance procedure(s), connect the spark-plug wire to the spark plug.

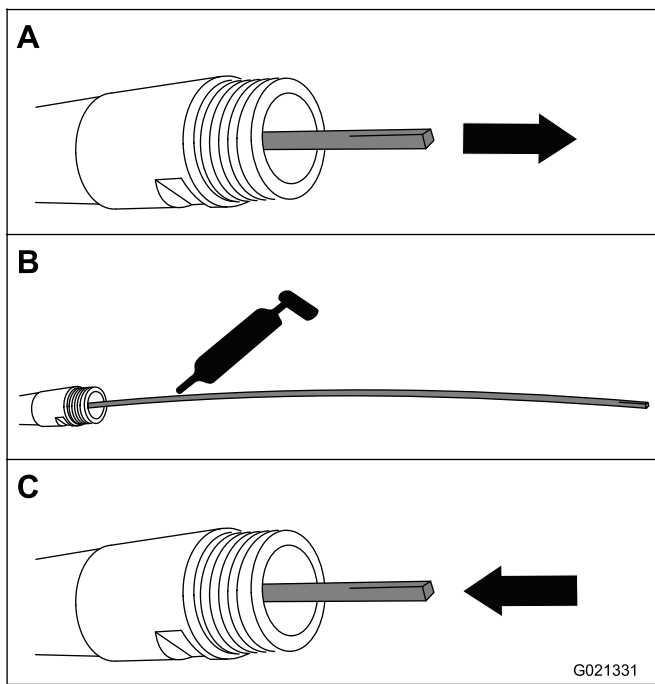


Figure 21

3. Coat the core with 1.5 mm (1/16 inch) of lithium-based grease (Figure 21B).

Note: Over-lubricating the core will shorten the life of the shaft.

4. Install the core into the shaft casing (Figure 21C).
5. Install the shaft onto the power unit.
6. Install the head onto the shaft.

Servicing the Air Cleaner

Service Interval: Every 25 hours/Yearly (whichever comes first)—Check the air cleaner for dirty, loose, or damaged parts, and clean or replace them if necessary.

Every 100 hours/Yearly (whichever comes first)—Replace the air-cleaner element (more frequently when operating the machine in dusty or dirty operating conditions).

1. Perform the pre-maintenance procedures; refer to Preparing the Machine for Maintenance (page 16).
2. Press the button on the air-cleaner cover (Figure 22) and open the cover.

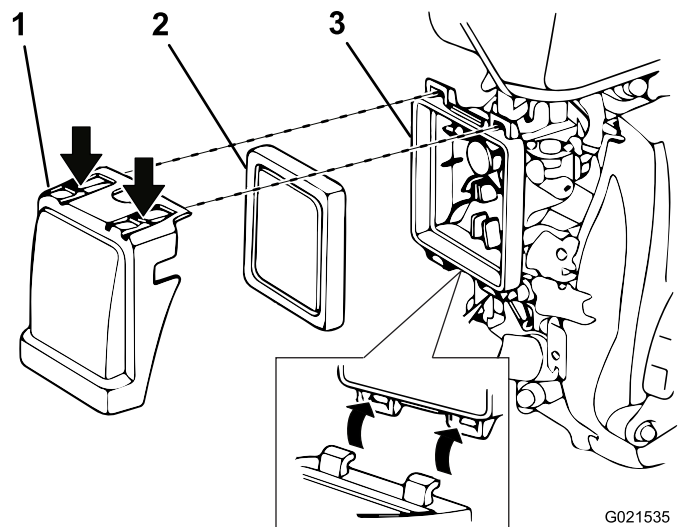


Figure 22

1. Air-cleaner cover
2. Air-cleaner element
3. Air-cleaner housing

3. Replace the air-cleaner element.
4. Install the air-cleaner cover.

Changing the Engine Oil

Service Interval: After the first 25 hours

Every 100 hours

Toro Premium Engine Oil is available from your Authorized Toro Dealer.

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

Crankcase capacity: 0.25 L (0.26 US qt)

Important: If the oil level in the crankcase is too low or too high and you run the engine, you may damage the engine. This type of damage is not covered by the warranty.

Note: Use SAE 10W-30 for general use. You can use SAE 30 when the average temperature in your area is within the indicated range (Figure 23).

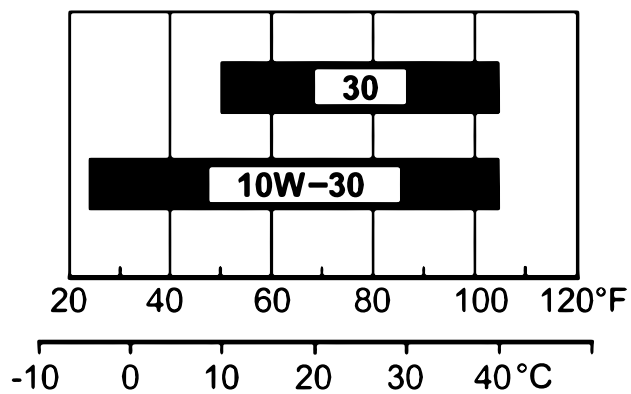


Figure 23

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Draining the Engine Oil

⚠ WARNING

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

Avoid contacting the hot engine oil when you drain it.

1. Stop the engine and wait for all moving parts to stop.
2. Disconnect the wire from the spark plug; refer to Preparing the Machine for Maintenance (page 16).
3. Place a drain pan under the oil-drain hole of the engine (Figure 24).

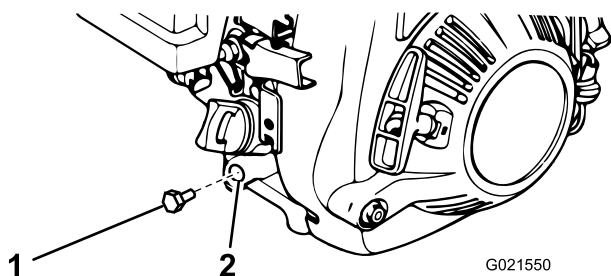


Figure 24

G021550

1. Oil-drain plug
2. Oil-drain hole

4. Remove the drain plug and catch the oil in the oil-drain pan (Figure 24).
5. When the oil has drained completely, install the drain plug with a new washer (Figure 24).

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

Filling the Engine Crankcase with Oil

1. Remove the dipstick (Figure 25) and slowly pour oil into the fill hole until the oil reaches the upper-limit mark (bottom edge of the oil-fill hole) on the dipstick.

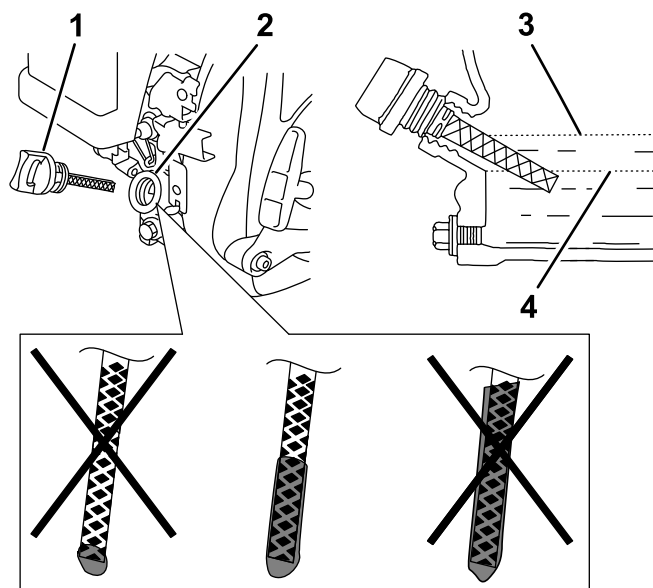


Figure 25

G021530

1. Oil-fill hole
2. Dipstick
3. Oil-level upper limit
4. Oil-level lower limit

2. Replace and secure the dipstick.
3. Wipe up any spilled oil.

Servicing the Spark Plug

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

Every 300 hours/Every 2 years (whichever comes first)—Replace the spark plug.

Type: NGK CR5HSB or equivalent

Gap: 0.6 to 0.7 mm (0.024 to 0.028 inch)

Note: Use a 5/8 inch (16 mm) spark-plug wrench for removing and installing the spark plug.

Removing the Spark Plug

1. Place the machine on a level surface and turn off the engine; refer to Stopping the Engine (page 14).
2. Ensure that the machine surfaces are cool.
3. Pull the spark-plug wire off the terminal of the spark plug.
4. Clean around the spark plug.
5. Rotate the spark plug counterclockwise using a 5/8 inch (16 mm) spark-plug wrench to remove the plug and the sealing washer (Figure 26).

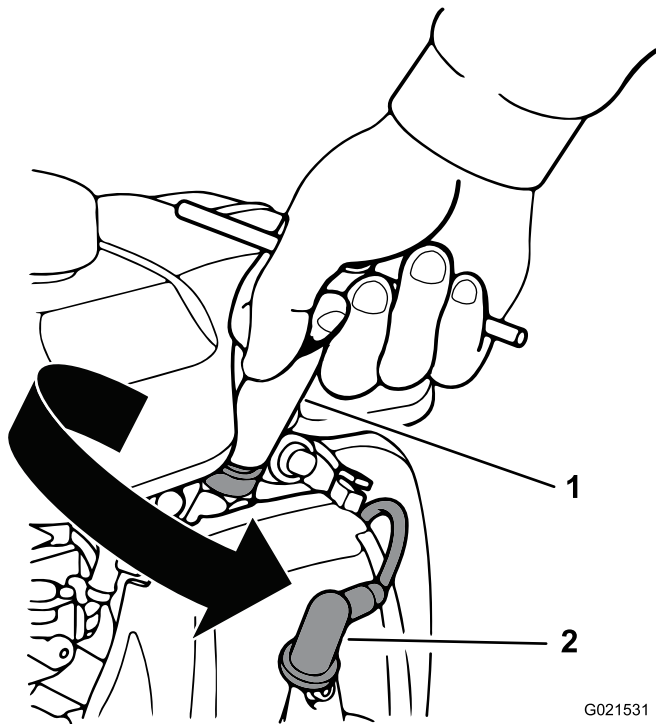


Figure 26

1. Spark-plug wrench
2. Wire

Checking the Spark Plug

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

1. Look at the center of the spark plug (Figure 27). 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.

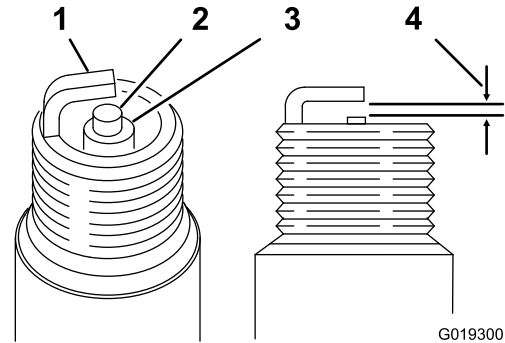


Figure 27

1. Side electrode
2. Center electrode
3. Insulator
4. 0.6 to 0.7 mm (0.024 to 0.028 inch)

2. Use a gapping tool for spark plugs or a feeler gauge to measure the gap between the side electrode and center electrode (Figure 27).
3. If the gap is not within the specified 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 0.6 to 0.7 mm (0.024 to 0.028 inch).
 - B. If the gap is **too large**, carefully bend the side electrode **toward** the center electrode until the gap between the electrodes is 0.6 to 0.7 mm (0.024 to 0.028 inch).

Installing the Spark Plug

Important: Ensure that the gap between the side and center electrodes is 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 the spark plug clockwise using a 5/8 inch (16 mm) spark-plug wrench until the plug and sealing washer are seated (Figure 26).
3. Tighten the spark plug as follows:

- When installing an **in-service** spark plug, tighten the plug an additional 1/8 to 1/4 turn.
 - When installing a **new** spark plug, tighten the plug an additional 1/2 turn.
4. Push the spark-plug wire onto the terminal of the spark plug (Figure 26).

Servicing the Spark Arrester

Cleaning the Spark Arrester

Service Interval: Every 100 hours

Note: A spark arrester is available as an option. If you require a spark arrester, contact your Authorized Toro Service Dealer.

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

⚠ WARNING

If the engine has been running, the muffler will be hot.

Avoid contacting the muffler.

1. Remove the 3 bolts (5 mm), and remove the muffler protector (Figure 28).

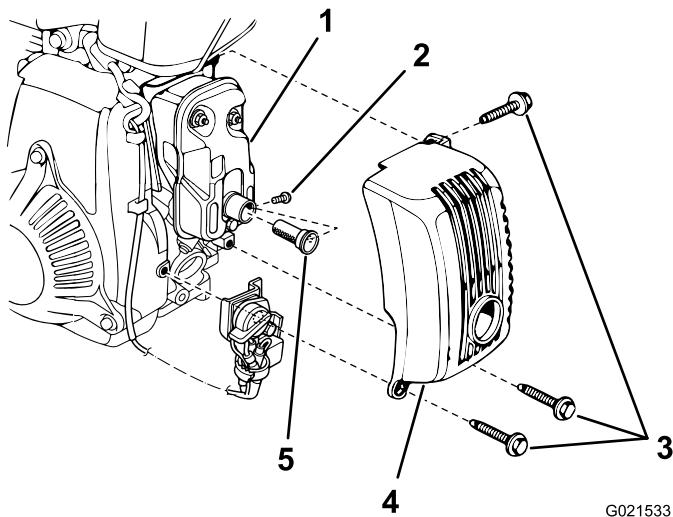
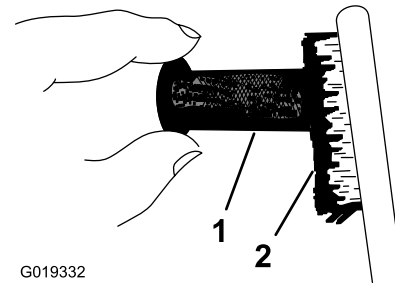


Figure 28

- | | | |
|------------------|----------------------|-------------------|
| 1. Muffler | 3. Bolts (5 mm) | 5. Spark arrester |
| 2. Special screw | 4. Muffler protector | |

2. Remove special screw from the spark arrester, and remove the spark arrester from the muffler (Figure 28).
3. Use a brush to carefully remove carbon deposits from the spark-arrester screen (Figure 29).

Note: Replace the spark arrester if it has breaks or holes.



G019332

Figure 29

- | | |
|-----------|----------|
| 1. Screen | 2. Brush |
|-----------|----------|

4. Install the spark arrester and muffler protector in the reverse order of disassembly.

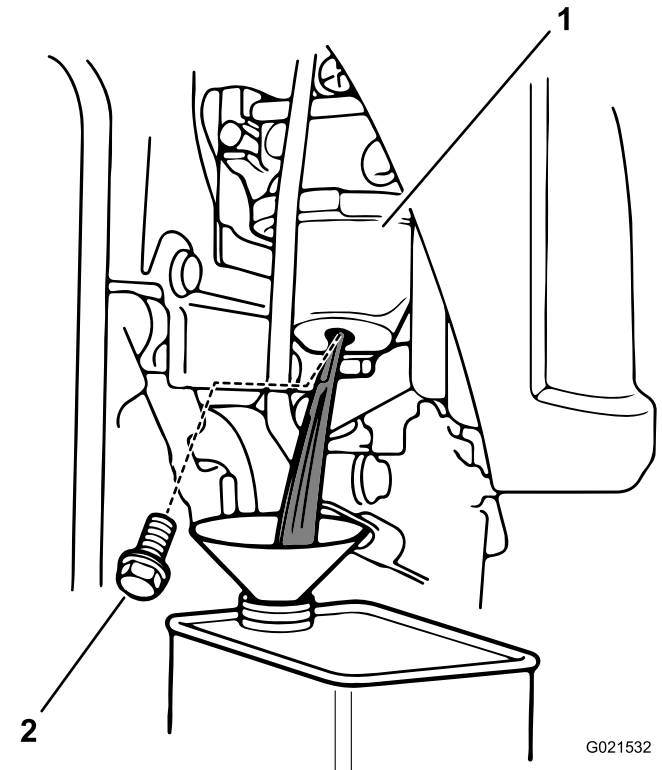
Servicing the Fuel System

Draining the Fuel Tank and Carburetor

Service Interval: Yearly or before storage—Drain the fuel tank and carburetor.

1. Place the machine on a level surface and stop the engine; refer to Stopping the Engine (page 14).
2. Ensure that the engine and the exhaust system surfaces are cool.
3. Place an approved gasoline container below the carburetor (Figure 30).

Note: Use a funnel to avoid spilling fuel.



G021532

Figure 30

- | | |
|---------------|---------------|
| 1. Carburetor | 2. Drain bolt |
|---------------|---------------|

4. Remove the carburetor drain bolt (Figure 30).
5. Move the fuel valve lever to the On position.
6. After all the fuel has drained into the container, install the drain bolt and tighten it securely.

Servicing the Belt

Checking and Adjusting the Belt Tension

Service Interval: Every 100 hours—Inspect the belt and belt tension, and adjust or replace the belt as needed.

1. Place the machine on a level surface and stop the engine; refer to Stopping the Engine (page 14).
2. Remove the 5 screws that secure the belt guard to the belt mounting plate (Figure 31).

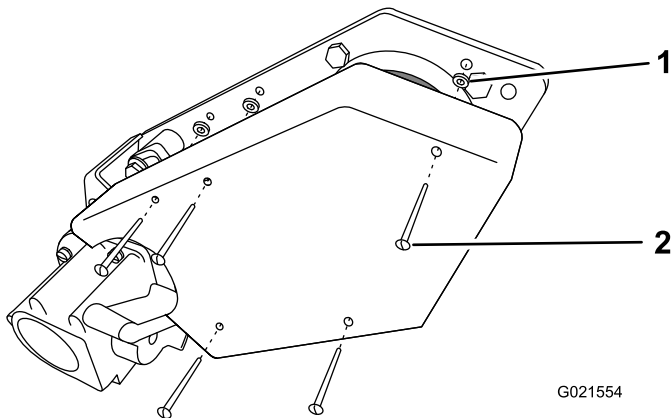


Figure 31

1. Plastic washer (5)
2. Screw (5)

3. Remove the belt guard.
4. Lay a straightedge along the drive belt, from one pulley to the other.
5. With your finger, push on the belt with 6.8 kg (15 lb) of pressure, midway between the pulleys (Figure 32).

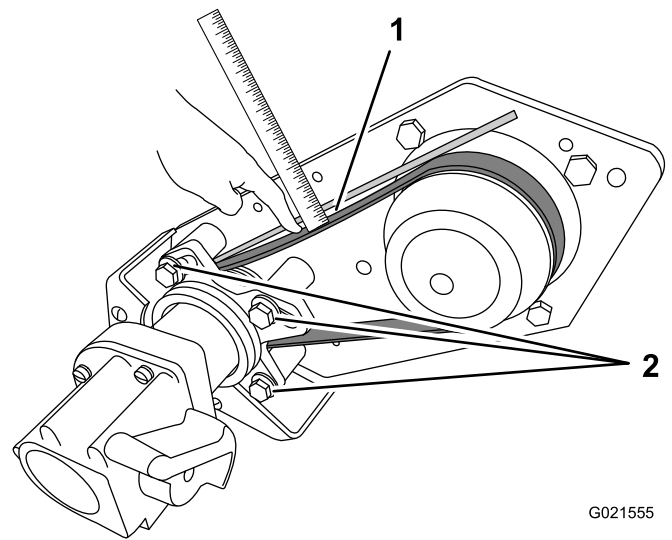


Figure 32

1. Flex of 1 cm (13/32 inch)
2. Bolts

6. Measure the distance from the belt to the straightedge. The distance should be approximately 1 cm (13/32 inch).
7. If the belt tension is not correct, adjust it as follows:
 - A. Loosen the 3 bolts that secure the lower pulley to the belt mounting plate.
 - B. Pivot the lower pulley counterclockwise to tighten the belt, or clockwise to loosen the belt.
 - C. When the belt tension is correct, tighten the bolts.
8. Install the belt guard with the 5 screws and plastic washers (Figure 31).

Replacing the Belt

1. Place the machine on a level surface and stop the engine; refer to Stopping the Engine (page 14).
2. Remove the 5 screws that secure the belt guard to the belt mounting plate, and remove the belt guard.
3. Remove the 3 bolts that secure the lower pulley to the belt mounting plate.
4. Install a new belt on the upper pulley.
5. Align the belt over the lower pulley, and install the lower pulley with the 3 bolts.
6. Adjust the belt tension; refer to Checking and Adjusting the Belt Tension (page 21).
7. Install the belt guard with the 5 screws and plastic washers Figure 31.

Storage

Store the machine in a cool, clean, dry place.

Preparing the Machine for Storage

⚠ WARNING

Gasoline vapors can explode.

- Do not store gasoline more than 30 days.
 - Do not store the machine in an enclosure near an open flame.
 - Allow the engine to cool before storing it.
1. On the last refueling of the year, add fuel stabilizer to the fuel as directed by the engine manufacturer.
 2. Run the machine until the engine stops from running out of fuel.
 3. Prime the engine and start it again.
 4. Allow the engine to run until it stops. When you can no longer start the engine, it is sufficiently dry.
 5. Disconnect the wire from the spark plug.
 6. Remove the spark plug, add 30 ml (1 oz.) of oil through the spark plug hole, and pull the starter rope **slowly** several times to distribute oil throughout the cylinder to prevent cylinder corrosion during the off-season.
 7. Install the spark plug and tighten it with a torque wrench to 20 N·m (15 ft·lb).
 8. Tighten all nuts, bolts, and screws.

Troubleshooting

Problem	Possible Cause	Corrective Action
The engine does not start.	<ol style="list-style-type: none"> 1. The fuel valve is in the Off position. 2. The choke is open. 3. The choke is closed. 4. The On/Off switch on the engine is in the Off position. 5. The engine oil level is low. 6. The wire is not connected to the spark plug. 7. The fuel cap vent hole is plugged. 8. The spark plug is pitted, fouled, or incorrectly gapped . 9. The spark plug is wet with fuel (flooded engine). 10. The fuel tank is empty or the fuel system contains stale fuel. 	<ol style="list-style-type: none"> 1. Move the fuel-valve lever to the On position. 2. Close the choke when starting a cold engine. 3. Open the choke when starting a hot engine. 4. Rotate the switch to the On position. 5. Fill the engine to the proper level with the recommended oil. 6. Connect the wire to the spark plug. 7. Clean the fuel cap vent hole or replace the fuel cap. 8. Check the spark plug and adjust the gap if necessary. Replace the spark plug if it is pitted, fouled, or cracked. 9. Remove the spark plug, dry it, and install the plug. Start the engine with the throttle in the Max position. 10. Drain and/or fill the fuel tank with fresh gasoline. If the problem persists, contact an Authorized Service Dealer.
The engine starts hard or loses power.	<ol style="list-style-type: none"> 1. The fuel cap vent hole is plugged. 2. The air filter element is dirty and is restricting the air flow. 3. The spark plug is pitted, fouled, or incorrectly gapped . 4. The engine oil level is too low, too high, or excessively dirty. 5. The fuel tank contains stale fuel. 	<ol style="list-style-type: none"> 1. Clean the fuel cap vent hole or replace the fuel cap. 2. Clean the air filter pre-cleaner and/or replace the paper air filter. 3. Check the spark plug and adjust the gap if necessary. Replace the spark plug if it is pitted, fouled, or cracked. 4. Check the engine oil. Change the oil if it is dirty; add or drain the oil to adjust the oil level to the Full mark on the dipstick. 5. Drain and fill the fuel tank with fresh gasoline.
The engine runs rough.	<ol style="list-style-type: none"> 1. The choke is left on. 2. The wire is not connected to the spark plug. 3. The air filter element is dirty and is restricting the air flow. 4. The spark plug is pitted, fouled, or incorrectly gapped . 5. There is too much oil in the engine crankcase. 	<ol style="list-style-type: none"> 1. Open the choke. 2. Connect the wire to the spark plug. 3. Clean or replace the air filter element. 4. Check the spark plug and adjust the gap if necessary. Replace the spark plug if it is pitted, fouled, or cracked. 5. Drain the oil to the proper level.
The drive belt is worn or burned, or it jumps off of the pulley.	<ol style="list-style-type: none"> 1. The drive-belt tension needs adjustment. 2. The drive belt may be stretched. 3. The pulleys are out of alignment. 	<ol style="list-style-type: none"> 1. Adjust the drive-belt tension. 2. Replace the drive belt. 3. Contact your Authorized Service Dealer.
The machine or engine vibrates excessively.	<ol style="list-style-type: none"> 1. The engine mounting bolts are loose. 	<ol style="list-style-type: none"> 1. Tighten the engine mounting bolts.



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 procedure¹:

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

¹Toro Authorized Rental Customers who have purchased products directly from Toro and have signed the Toro Rental Customer Agreement have the ability to perform their own warranty work. Please visit Toro's Rental Portal for electronic warranty claim filing procedures or call the toll free number above.

Owner Responsibilities

You must maintain your Toro Product by following the maintenance procedures described in the *Operator's Manual*. Such routine

maintenance, whether performed by a dealer or by you, is at your expense. Parts scheduled for replacement as required maintenance ("Maintenance Parts"), are warranted for the period of time up to the scheduled replacement time for that part. Failure to perform required maintenance and adjustments can be grounds for disallowing a warranty claim.

Items and Conditions Not Covered

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

- Product failures which result from the use of non-Toro replacement parts, or from installation and use of add-on, modified, or unapproved accessories
- Product failures which result from failure to perform required maintenance and/or adjustments
- Product failures which result from operating the Product in an abusive, negligent or reckless manner
- Parts subject to consumption through use unless found to be defective. Examples of parts which are consumed, or used up, during normal product operation include, but are not limited to, belts, 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.