



Count on it.

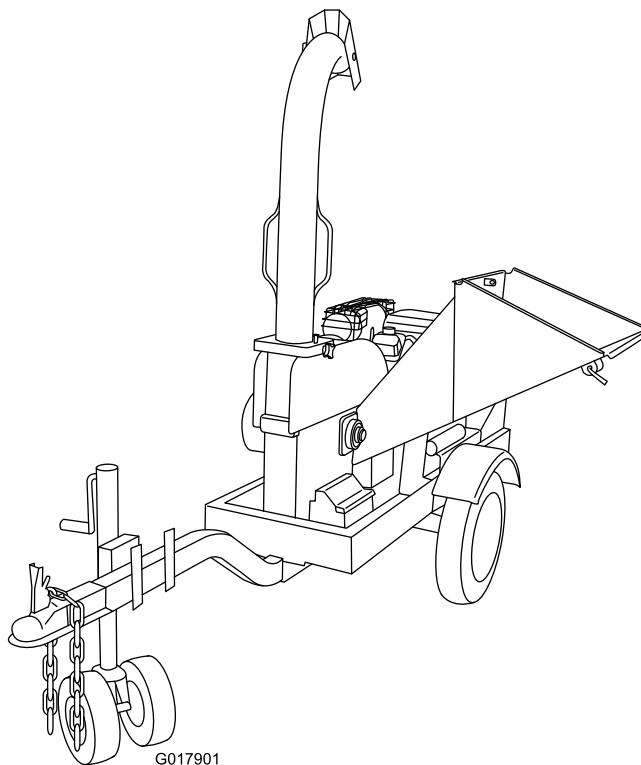
Operator's Manual

BC-25 Brush Chipper

Model No. 22614—Serial No. 311000001 and Up

Model No. 22614G—Serial No. 311000001 and Up

Model No. 32614—Serial No. 312000001 and Up



G017901



WARNING

CALIFORNIA Proposition 65 Warning

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

⚠ DANGER

Watch for overhead power lines in the work area. Shock or explosion may occur if you come in to contact with them.

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.

Introduction

This brush chipper is designed to chip branches, vines, leaves, and small tree limbs up to 6 in. (15.24 cm) in diameter. It is not intended to chip rocks, wire, metal, or any materials other than wood. The brush chipper can be towed behind a vehicle equipped with an appropriate ball hitch.

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. Write the numbers in the space provided.

Model No. _____

Serial No. _____

This manual identifies potential hazards and has safety messages identified by the safety alert symbol (Figure 1), which signals a hazard that may cause serious injury or death if you do not follow the recommended precautions.



Figure 1

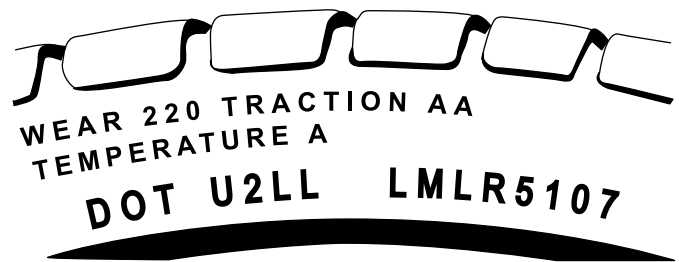
1. Safety alert symbol

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.

Tire Information

The DOT tire identification number (TIN) is branded into the sidewall of all street legal tires (Figure 2).



g012871

Figure 2

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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.

If you believe that your vehicle* has a defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying The Toro Company.

If NHTSA receives similar complaints, it may open an investigation, and if it finds that a safety defect exists in a group of vehicles*, it may order a recall and remedy campaign. However, NHTSA cannot become involved in individual problems between you, your dealer, or The Toro Company.

To contact NHTSA, you may call the Vehicle Safety Hotline toll-free at 1-888-327-4236 (TTY: 1-800-424-9153); go to <http://www.safercar.gov> ; or write to: Administrator, NHTSA, 400 Seventh Street, SW., Washington, DC 20590. You can also obtain other information about motor vehicle safety from <http://www.safercar.gov>.

* Brush chipper trailer

Training

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

Towing

Check with your local county or state safety towing regulations, in addition to meeting Department of Transportation (DOT) Safety Towing Regulations, before towing the machine.

- In order to reduce the possibility of an accident while transporting the machine on public roads, make sure the towing vehicle is mechanically sound and in good operating condition.
- Shut down the engine before transporting the machine.
- Inspect the hitch and coupling for wear. NEVER tow the machine with defective hitches, couplings, chains, etc.
- Check the tire air pressure on both of the towing vehicle and the machine. The chipper tires should be inflated to 60 psi (410 kpa) cold.
- Check the tire tread for wear.
- Properly attach the safety chains to the towing vehicle.
- Ensure that the towing vehicle's directional, backup, and brake lights are working properly.
- Avoid sudden stops and starts. This can cause skidding, or jack knifing. Smooth, gradual starts and stops will improve towing.
- Avoid sharp turns to prevent rolling. Tow only with a vehicle that has a hitch designed for towing. Do not attach towed equipment except at the hitch point.

Before towing check to make certain your machine is correctly and securely attached to the towing vehicle.

- Ensure that the ball hitch you are using is the proper size for the hitch coupler on the machine.
- Ensure that the safety chains are properly hooked to the vehicle, leaving enough slack for turning.
- Ensure that the jack stand is secured in the Up position.
- Do not tow the machine faster than 45 mph (75 km/h).
- Use caution when backing up; use a spotter outside the vehicle to guide you.
- Do not allow anyone to sit or ride on the unit.
- Do not carry any cargo or wood on the unit when towing.
- Disconnect the unit from the tow vehicle before using it.
- Place chock blocks underneath the wheel to prevent rolling while the unit is parked.

Preparation

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

- Evaluate the terrain to determine what accessories and attachments are needed to properly and safely perform the job. Only use accessories and attachments approved by the manufacturer.
- Wear appropriate clothing including hard hat, face shield, safety glasses, long pants, safety shoes, and hearing

protection. Long hair, loose clothing or jewelry may get tangled in moving parts. Wear tight fitting gloves without drawstrings or loose cuffs.

- Use extra care when handling gasoline and other fuels. They are flammable and vapors are explosive.
 - Use only an approved container
 - Never remove the gas cap or add fuel with the engine running. Allow the engine to cool before refueling. Do not smoke.
 - Never refuel or drain the machine indoors.
 - Replace the gasoline cap and tighten it securely.
 - Keep the container nozzle in contact with the tank during filling.
 - If gasoline is spilled, wipe it off the engine and equipment.
- Ensure that the machine is on a level surface before operating.
- Always operate the machine from the side of the hopper.
- Block the wheels of the machine to prevent unintended movement.

Operation

- Before starting this machine, review the [Safety \(page 3\)](#) section. Failure to follow these rules may result in serious injury to the operator or bystanders.
- Never run an engine in an enclosed area.
- Only operate the machine in good light, keeping away from holes and hidden hazards.
- Only start the engine from the operator's position.
- Do not pass or stand on the discharge side of the machine when the engine is running or when the flywheel is turning.
- Ensure that all the guards and shields are securely in place before operating.
- Ensure that all interlocks are attached, adjusted properly, and functioning properly.
- Do not change the engine governor setting or overspeed the engine.
- Stop on level ground, and shut off the engine before leaving the operator's position for any reason.
- Chock the machine or keep it attached to the towing vehicle when not in use to prevent the unit from rolling.
- Keep hands and feet away from any moving parts.
- Never carry passengers, and keep pets and bystanders away.
- Do not operate the machine under the influence of alcohol or drugs.
- 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 stop the engine and verify the chipper flywheel has stopped rotating.
- Do not touch parts which may be hot from operation. Allow them to cool before attempting to maintain, adjust, or service the machine.
- 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.
- Do not allow anyone to operate this machine without proper instruction.
- Keep area of discharge clear of people, animals, buildings, glass, or anything else that will obstruct clear discharge, cause injury, or damage. Wind can also change discharge direction. If it becomes necessary to push material into the hopper, use a small diameter wood stick, not your hands.
- Do not use the machine with the hopper or discharge chute removed.
- Clear the area of objects such as wire, rope, etc. Inserting these objects into the hopper could damage the flywheel and/or cause injury.
- Keep your face and body away from the hopper to avoid accidental bounce back of any material.
- If you hear or see material being kicked back against the rubber flap, shut the feeder chute door until the material has passed.
- When feeding material into the hopper, be extremely careful that pieces of metal, rocks, or other foreign objects are not included. Personal injury or damage to the machine could result.
- Shut off the engine and wait for the moving parts to come to a complete stop before removing processed material, leaves, or debris from the machine.
- Remove the key, disconnect the spark plug wires and keep the wire away from the spark plug to prevent accidental starting while adjusting the machine.
- If the cutting mechanism strikes a foreign object or if your machine should start making an unusual noise or vibration, stop the engine and wait five minutes for all moving parts to come to a complete stop and cool. Vibration is generally a warning of trouble. Disconnect the spark plug wires and inspect for clogging or damage. Clean and repair and/or replace damaged parts.
- Do not touch parts that may be hot from operation. Allow them to cool before attempting to maintain, adjust, or service the machine.
- Never move this machine while the engine is running.
- Before every use:
 - Inspect the coupler, ball and hitch.
 - Ensure that all lights are functioning properly.

- Ensure that the tires are properly inflated as recommended.
- Ensure that the lug nuts are tight and torqued properly.
- Ensure that the machine is properly secured.

Maintenance and Storage

- Stop the engine. Wait for all movement to stop before adjusting, cleaning, or repairing.
- Clean debris from the mufflers and engine to help prevent fires. Clean up any oil or fuel spillage.
- Let the engine cool before storing.
- Do not store fuel near flames or drain indoors.
- Park the machine on level ground. Never allow untrained personnel to service the machine.
- 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 all nuts, bolts, screws, hydraulic fittings, and hose clamps securely tightened. Keep equipment in good condition.
- Do not tamper with safety devices.
- Use extra care when handling gasoline and other fuels. They are flammable and vapors are explosive.
 - Use only an approved container.
 - Never remove the gas cap or add fuel 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, trunk, pick-up bed, or any surface other than the ground.
 - Keep container nozzle in contact with the tank during filling.
- Stop and inspect the machine if you strike an object. Make any necessary repairs before restarting.
- Use only genuine Toro replacement parts to ensure that the original standards are maintained.

Safety and Instructional Decals

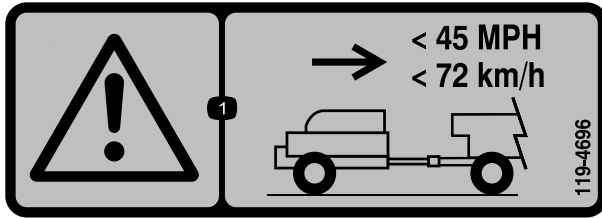


Safety decals and instructions are easily visible to the operator and are located near any area of potential danger. Replace any decal that is damaged or lost.

CALIFORNIA SPARK ARRESTER WARNING

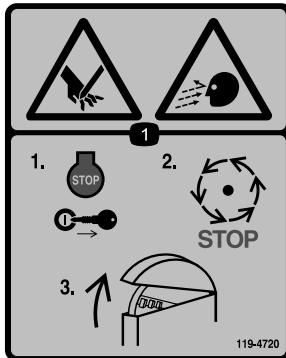
Operation of this equipment may create sparks that can start fires around dry vegetation. A spark arrester may be required. The operator should contact local fire agencies for laws or regulations relating to fire prevention requirements. 117-2718

117-2718



119-4696

1. Warning—do not exceed 45 mph (72 kmh) when transporting the machine.



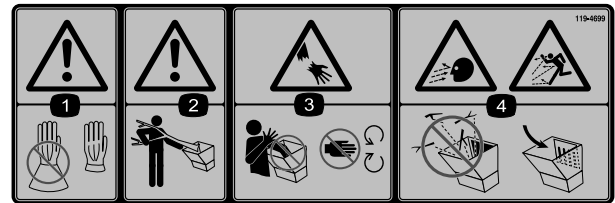
119-4720

1. Cutting/dismemberment hazard of hand; thrown object hazard, face—stop the engine, remove the key and wait for all moving parts to stop before opening the guard.



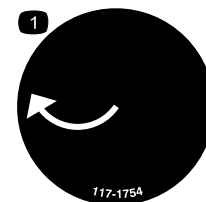
119-4698

1. Warning—read the *Operator's Manual*.
2. Warning—read the *Operator's Manual*, do not operate this machine unless you are trained.
3. Thrown object hazard, face—wear eye protection.
4. Thrown object hazard—keep bystanders a safe distance from the machine.
5. Cutting/dismemberment hazard of hand, blade—stay away from moving parts, keep all guards and shields in place.



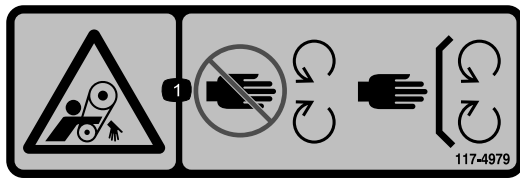
119-4699

1. Warning—do not operate wearing gloves with loose gauntlets, use gloves without loose material.
2. Warning—do not entangle body with material when using machine.
3. Cutting/dismemberment hazard arm—do not place arm in hopper; stay away from moving parts, keep all guards and shields in place.
4. Thrown object hazard, face and body—do not let loose material to escape from hopper, put shroud in place.



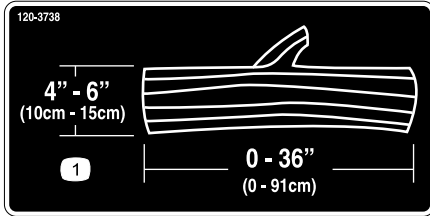
117-1754

1. Rotational direction and spin indicator



117-4979

1. Rotating belt — Keep guard in place
-



120-3738

1. When chipping branches with widths of 4 to 6 inches, cut the branches to lengths of 36 inches or less to prevent clogging of the chipper.
-

Product Overview

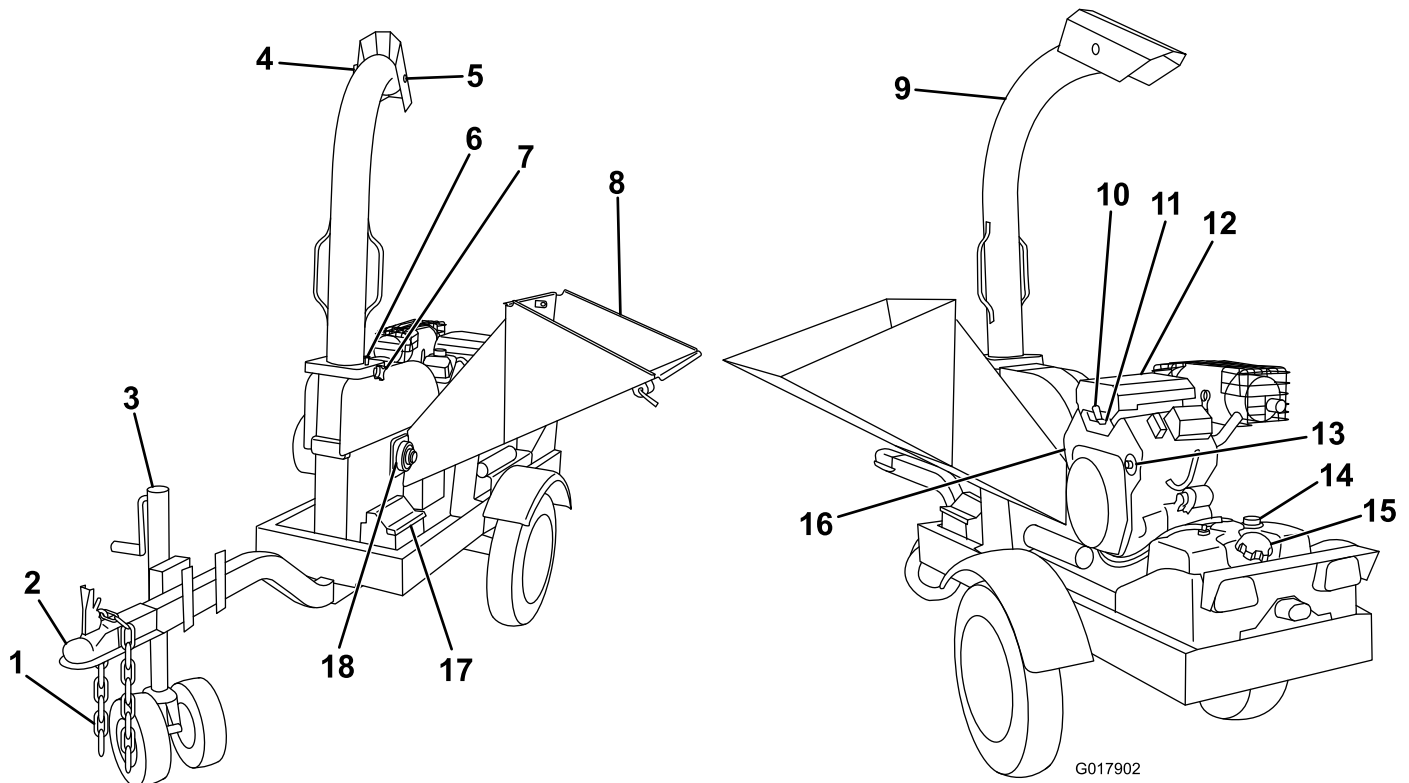


Figure 3

- | | |
|---------------------------|----------------------|
| 1. Safety chains | 10. Choke |
| 2. Coupler | 11. Throttle |
| 3. Jack stand | 12. Air filter |
| 4. Deflector locking knob | 13. Key switch |
| 5. Deflector | 14. Fuel level gauge |
| 6. Chute locking pin | 15. Fuel cap |
| 7. Chute locking knob | 16. Fuel filter |
| 8. Hopper | 17. Battery |
| 9. Discharge chute | 18. Flywheel bearing |

Controls

Become familiar with all the controls before you start the engine and operate the machine.

Hopper Latch

The hopper, mounted on the side of the machine, swings down for machine operation. The revolving blades mounted on a flywheel behind the hopper turn branches fed into the hopper into chips. The chipper can chip branches and vines ranging in size up to 6 inches (15 cm) in diameter and up to 3 feet (1 meter) in length.

To release the hopper or hopper latch ([Figure 4](#)), pull on the handle and rotate it up or down to engage the latch pin behind the stop.

Pull hopper down to open.

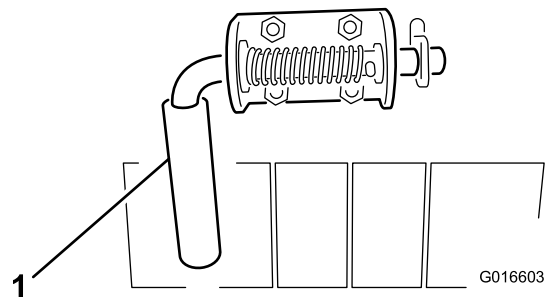


Figure 4

1. Hopper latch

Specifications

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

Hopper Opening	6 inches (15 cm) maximum diameter
Length	111 inches (282 cm)
Width	35 inches (89 cm)
Height	81 inches (206 cm)
Weight	1056 lbs (478 Kg)
Engine	Kohler 725cc, V-Twin, gas
Tire Pressure	60 psi (413.5 kPa)
Fuel Tank Capacity	5.5 Gal (20.8 L)

Operation

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

Important: Before operating, check the fuel and oil level, and remove debris from the machine. Ensure that the area is clear of people.

Towing

Do not tow over 45 mph (72 km/h)

1. Raise hopper and lock into the up position. Rotate the chute toward the rear of the machine, lock in position with the chute locking pin and tighten chute locking knob (Figure 3).
2. Crank the handle of the lift jack to align the coupler with the ball of the tow vehicle.
3. Remove the locking pin from the lever, squeeze the latch lock and lift the lever up to open the coupler (Figure 5).

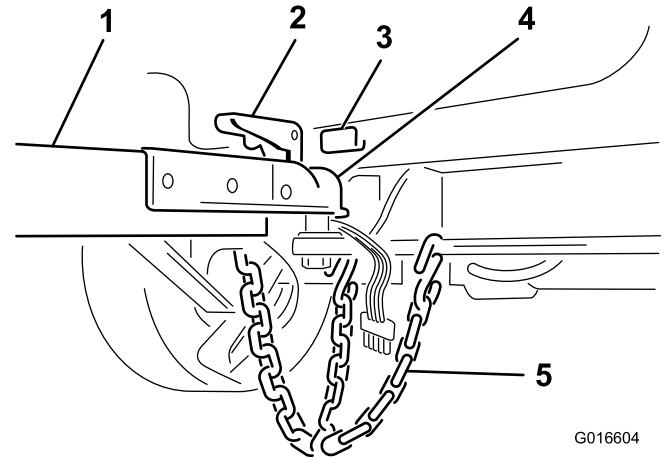


Figure 5

1. Tongue
2. Lever in locked position
3. Locking pin
4. Coupler
5. Safety chain

4. Attach coupler to a class I or higher 2 inch (50.8 mm) ball on a towing vehicle and latch securely.
 - If coupler does not fit over the ball, turn adjustment nut one turn counter-clockwise.
 - If coupler hitch is too loose on the ball, turn adjustment nut one turn clockwise.

⚠ WARNING

Failure to properly engage the hitch ball in the coupler ball socket and securely lock the coupler latch mechanism can cause the unit to become detached from the tow vehicle while traveling, which may cause serious injury and property damage.

5. Install the locking pin to secure the lever (Figure 5).
6. Cross or “X” the safety chains and attach them to the holes on the hitch.
7. Plug tail light wire harness connector to the tow vehicle connector. Check to make sure the brake lights illuminate properly with the brake pedal applied and the taillights flash when the turning signals are use.
8. Raise jack stand so caster wheels are free of the ground, pull the release pin and rotate wheels rearward and lock in the horizontal position (Figure 6).

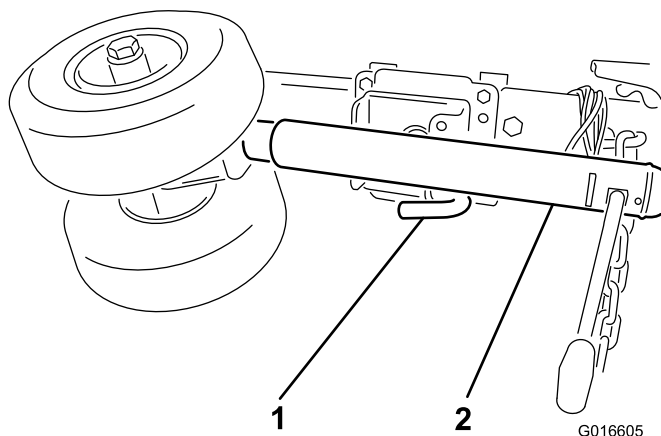


Figure 6

1. Release pin

2. Jack stand

thrown out and injure persons in the vicinity and damage the equipment.

- 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.
- Disconnect the unit from the tow vehicle, position it on a level location and block the wheels front and back to prevent it from moving.
- Check the fuel and oil level of the engine.

Tires and Wheels

The most common cause of tire trouble is under-inflation. It is important that you maintain full air pressure.

Inflate main axle tires to 60 psi (410 kpa)

Check the torque of the wheel lug nuts initially and after the first 10 hours of operation.

Torque wheel lug nuts to 80-90 ft.-lbs (108-122 Nm)

Before you Start

- Review all the machine's safety decals.
- Use a hard-hat, hearing protection, tight fitting gloves without draw strings or loose cuffs, and eye protection. A mesh visor alone does not provide sufficient eye protection; supplement with protective glasses.
- Ensure that you are familiar with safety regulations and shutdown procedures described in this unit's *Operator's Manual* and *Engine Owner's Manual*.
- Ensure that all guards are in place and in good condition.
- Ensure that the blades are in place and in good condition.
- Ensure that the work areas and blades are free from metallic objects such as wire, nails, etc. that could be

Adding Fuel

Use unleaded gasoline (87 pump octane minimum). Leaded, regular gasoline may be used if unleaded is not available.

⚠ 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.
- 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.

Important: Do not use methanol, gasoline containing methanol, or gasohol containing more than 10% ethanol because the fuel system could be damaged. Do not mix oil with gasoline.

Using Stabilizer/Conditioner

Use a fuel stabilizer/conditioner in the machine to provide the following benefits:

- Keeps gasoline fresh during storage of 90 days or less. For longer storage it is recommended that the fuel tank be drained.
- Cleans the engine while it runs.
- Eliminates gum-like varnish buildup in the fuel system, which causes hard starting.

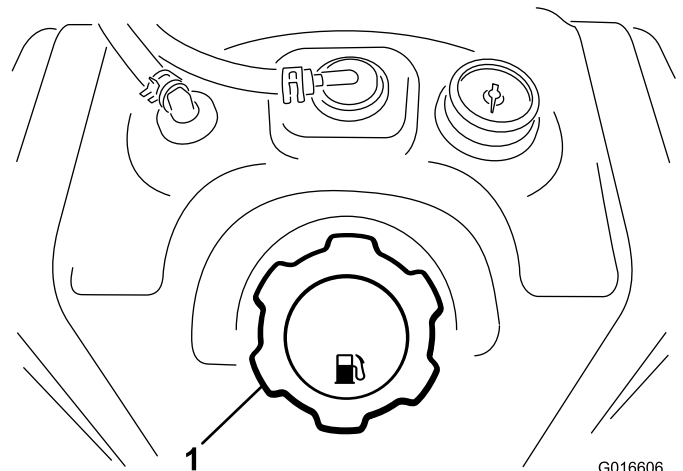
Important: Do not use fuel additives containing methanol or ethanol.

Add the correct amount of gas stabilizer/conditioner to the gas.

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

Filling the Fuel Tank

1. Park the machine on a level surface, and stop the engine.
2. Allow the engine to cool.
3. Clean around the fuel tank cap and remove it (Figure 7).



G016606

Figure 7

1. Fuel tank cap

4. Add unleaded 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.

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

5. Install the fuel tank cap securely, turning it until it clicks.
6. Wipe up any gasoline that may have spilled.

Hour Meter

The hour meter records the number of hours the engine has operated. It operates when the engine is running.

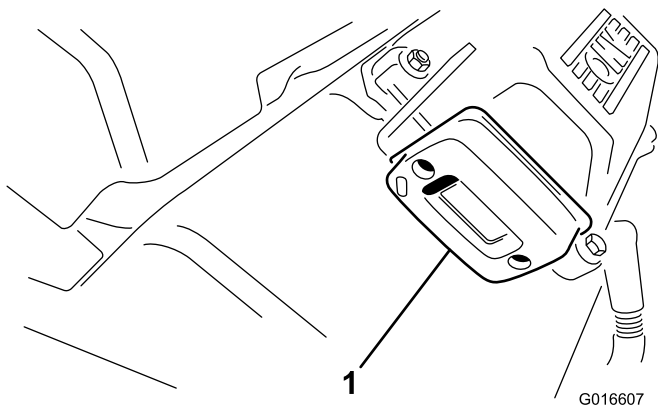


Figure 8

1. Hour meter

Checking the Engine Oil Level

Service Interval: Before each use or daily

1. Place the machine on a flat level surface, and stop the engine.
2. Allow the engine to cool.
3. Clean around the oil dipstick.
4. Remove the dipstick and wipe the end clean.
5. Slide the dipstick fully into the dipstick tube without threading it into the filler neck.
6. Pull the dipstick out and look at the end. The oil should be to the top of the upper limit range (Figure 9).

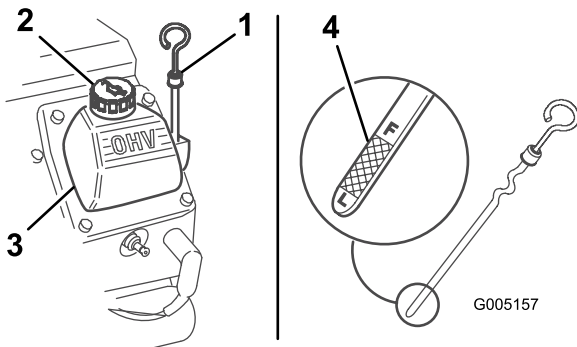


Figure 9

1. Oil dipstick
2. Oil fill cap
3. Valve cover
4. Metal end

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

7. If the oil level is low, slowly pour only enough oil into the crankcase to raise the level to the upper limit.

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

8. Replace the dipstick.

Changing the Chute Position

The discharge chute on this machine can be rotated to use in various positions. Rotate to the side, away from the hopper when using the machine.

1. To rotate, loosen the clamp knob, then press the spring-loaded button on the locking pin handle in and pull the locking pin from the chute plate (Figure 10).

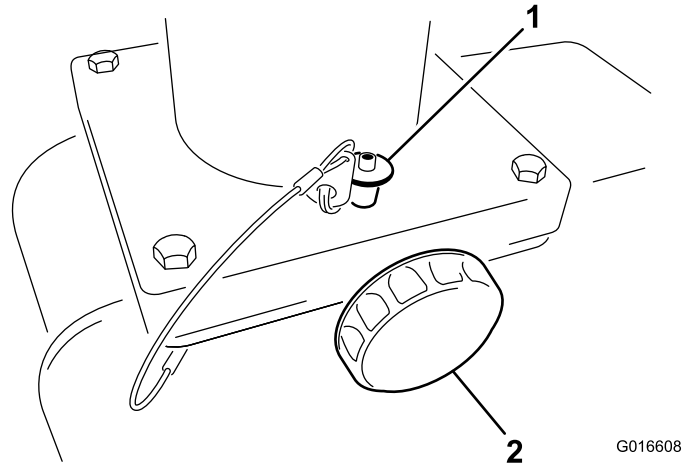


Figure 10

1. Locking pin button
2. Clamp knob

2. Rotate the chute into the position desired and secure with clamp knob.

Changing the Deflector Position

The deflector on the end of the chute can be rotated up and down to direct the discharge of chips.

1. Loosen the deflector knob and rotate the chute into the desired position (Figure 11).

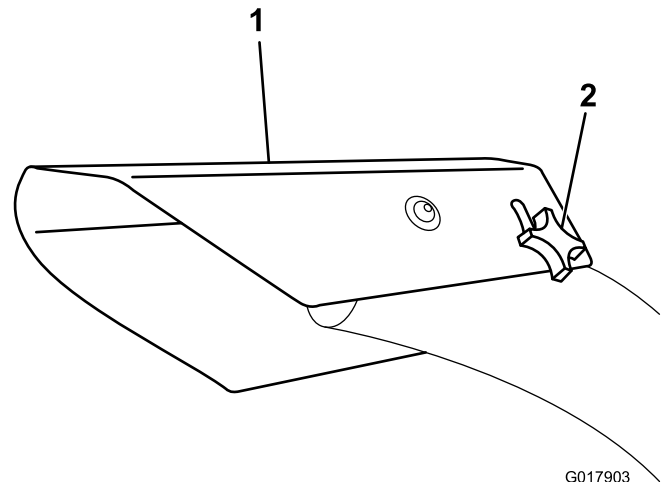


Figure 11

1. Chute deflector
2. Knob

2. Tighten the deflector knob.

Starting and Stopping the Engine

Starting the Engine

1. Move the choke lever to the On position (Figure 12).

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

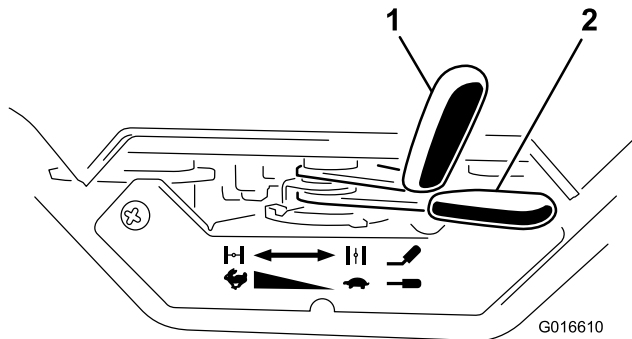


Figure 12

1. Choke
2. Throttle

2. Move the throttle lever one third of the way to the Fast position (Figure 12).
3. Turn the engine ignition switch to the Start position (Figure 13).

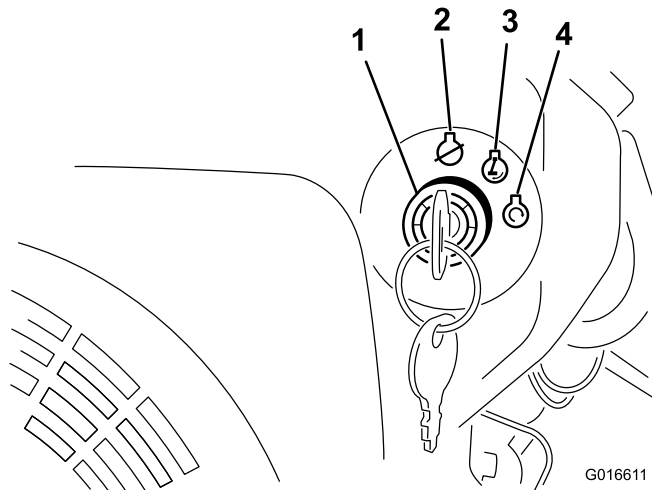


Figure 13

1. Ignition switch
2. Off
3. Run
4. Start

4. After the engine starts, release key to the Run position (Figure 13).
5. Gradually move the choke lever back to the Off position. If the engine stalls or hesitates, move the choke back to On again until the engine warms up. Then move it to the Off position.

6. When ready to chip brush, move the throttle lever to the Fast position.

Stopping the Engine

1. Move the throttle lever to the mid-range position.

Note: If the engine has been working hard or is hot, let it run for a minute before turning it off. This helps to cool the engine before stopping. In an emergency, the engine may be stopped immediately.

2. Turn the ignition switch to the Off position (Figure 13).

Using the Brush Chipper

Service Interval: Before each use or daily—Clean the inside of the cutting chamber cover.

⚠ DANGER

The machine will cut and amputate hands and feet.

- Stay in the operator's position while the machine is running.
- Keep all bystanders a safe distance from the machine.
- Stop the machine immediately if any people or animals enter the work area.
- Never place any part of your body into a position that causes an unsafe operating condition.

⚠ WARNING

Using the brush chipper may throw wood chips, soil, and other debris into the air which could injure you or bystanders.

- Always wear protective gear, such as safety goggles or face shield, hearing protection, tight-fitting gloves without draw strings or loose cuffs when using the machine.
- Keep face and body away from the feed opening. Do not overreach. Keep proper balance and footing at all time.
- Keep all bystanders at least 50 feet (15 meters) from the machine during operation.

1. Place the brush chipper on level, dry ground, disconnect from tow vehicle, and block the front and back of both wheels to prevent any movement.
2. Make sure you read all the recommendations from the [Safety \(page 3\)](#) section before using the brush chipper.
3. Start the engine; refer to Starting the Engine and allow engine to warm up at idle for two minutes.
4. Lower the hopper (Figure 14).

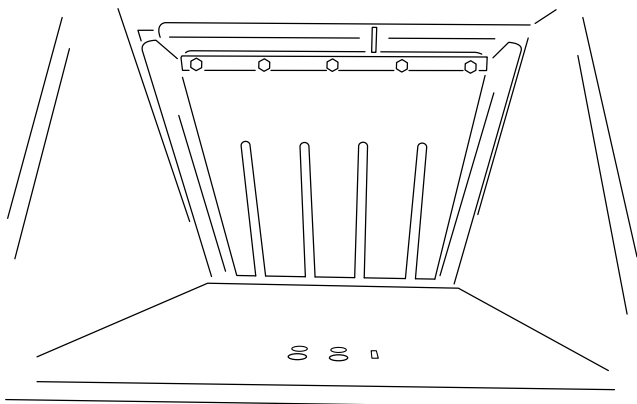


Figure 14

- To move a pile of processed material, use a spade, rake, or long handle tool. Never use your hands or feet!
- Limit the length of large branches to 3 feet long or less; longer lengths could cause the chipper to slow and jam.
- Wash out the cutting chamber after each use by spraying water from a garden hose into the hopper while the engine is running at full throttle. Do this for a few minutes to prevent accumulation of matter that can degrade the chipper performance.
- To stop the machine; refer to [Stopping the Engine \(page 13\)](#).

- Do not force material into the chipper. If the machine does not chip well, the chipper knife or cutter block may need to be sharpened or replaced.
- Extremely hard knots of wood will not process very well. Short stubs that have not self-fed through the chipper can be pushed through with the next branch to be chipped, otherwise simply close the upper chute.
- Overloading the hopper will cause the rotor speed to decrease. If you hear the engine RPM decreasing, stop feeding material into the hopper until the engine has returned to full speed ([Figure 15](#)).

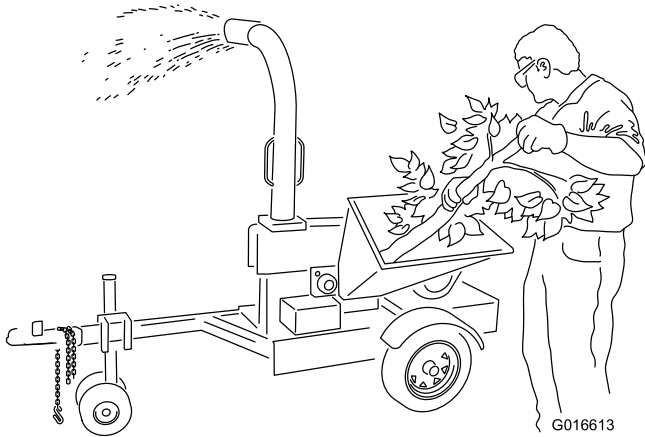


Figure 15

- If you jam the machine and do not stop the engine, it can damage the machine. For this reason, it is important that you immediately stop the engine if the machine becomes jammed, wait five minutes to make certain the flywheel and all moving parts have come to a complete stop and cool. Disconnect the spark plug wires, keeping them away from the spark plugs to prevent accidental starting.
- Never allow processed material to build up within 3 in (76.2 mm) of the discharge chute opening. Move the Brush Chipper or the pile as needed. Failure to do so could result in unnecessary jamming of the machine.

Maintenance

Important: Before performing any maintenance procedures, first stop the engine, wait 5 minutes to allow all moving parts to come to a complete stop and cool, and disconnect the spark plug wires.

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first 50 hours	• Change the engine oil.
Before each use or daily	• Check the engine oil level. • Clean the inside of the cutting chamber cover. • Grease the machine. • Check the drive belt tension. • Check the cutter block. • Inspect the cutter blades.
Every 25 hours	• Clean the foam pre-filter on the air filter.
Every 100 hours	• Replace the air filter. • Change the engine oil. • Replace the drive belt. • Inspect the tires.
Every 200 hours	• Check the spark plugs. • Replace the fuel filter.
Every 500 hours	• Lubricate wheel bearings. • Replace the spark plugs.
Yearly or before storage	• Change the engine oil.

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

Lubrication

Lubricate the Cutter Wheel Bearings

Service Interval: Before each use or daily

Grease Type: General-purpose grease.

1. Clean around grease zerk with a rag and lift the plastic cap off the grease zerk.
2. Pump several shots of grease into the fitting until it starts to ooze out of the bearing (Figure 16).

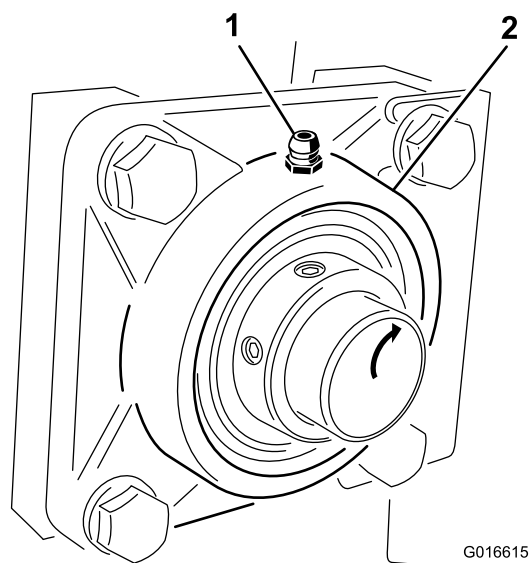


Figure 16

1. Grease zerk
2. Cutter wheel bearing

3. Wipe up any excess grease.

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

Lubricate the Wheel Bearings

Service Interval: Every 500 hours

Lubricate the wheel bearings with several pumps of No. 2 general purpose lithium base grease ([Figure 17](#)).

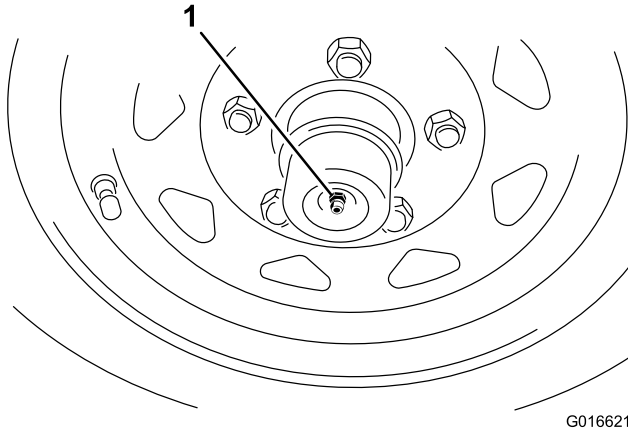


Figure 17

1. Grease zerk

Engine Maintenance

Servicing the Air Cleaner

Removing the Air Filter

1. Unscrew the knob and remove the air cleaner cover ([Figure 18](#)).

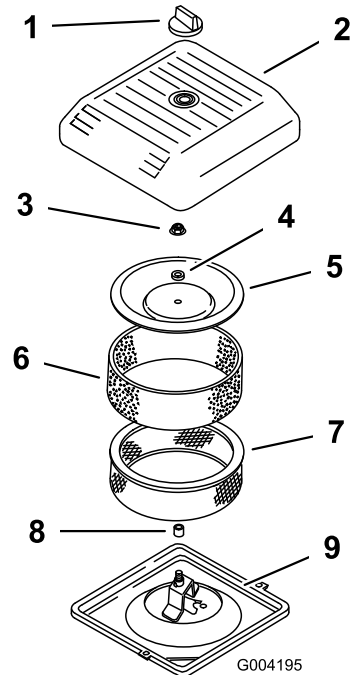


Figure 18

- | | |
|----------------------|---------------------|
| 1. Knob | 6. Foam pre-filter |
| 2. Air cleaner cover | 7. Paper filter |
| 3. Cover nut | 8. Rubber seal |
| 4. Spacer | 9. Air cleaner base |
| 5. Cover | |

2. Carefully slide the foam pre-filter off of the paper element.
3. Unscrew the cover nut and remove the cover, spacer and paper filter.

Cleaning the Foam Pre-Filter

Service Interval: Every 25 hours

1. Clean around the air cleaner to prevent dirt from getting into the engine and causing damage.
2. Remove the foam pre-filter; See [Removing the Air Filter](#) ([page 16](#)).

3. Wash the foam pre-filter in liquid soap and warm water. When clean, rinse it thoroughly.
4. Dry the pre-filter by squeezing it in a clean cloth and allow it to air dry.
5. Put one or two ounces of engine oil on the pre-filter (Figure 19).

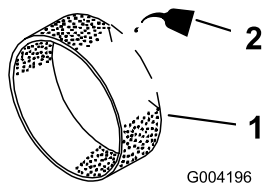


Figure 19

1. Foam element
2. Oil

6. Squeeze the pre-filter to distribute the oil.
7. Carefully slide the foam pre-filter onto the paper filter (Figure 18).
8. Install the air cleaner cover and secure it with the knob (Figure 18).

Replacing the Air Filter

Service Interval: Every 100 hours

Note: Do not clean the paper element. Replace the paper element if it is dirty or damaged.

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

1. Carefully slide the foam pre-filter onto the paper filter (Figure 18).
2. Place the air cleaner assembly onto the air cleaner base.
3. Install the cover, spacer and secure it with the cover nut.
4. Torque the nut to 60 in-lb (7 Nm).
5. Install the air cleaner cover and secure it with the knob.

Servicing the Engine Oil

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

Oil Type: Detergent oil with an API service of SG, SH, SJ or higher.

Crankcase Capacity: with filter 2 qt (1.9 liters)

Viscosity: SAE 10W-30 is recommended for general use.

Changing the Engine Oil

Service Interval: After the first 50 hours

Every 100 hours

Yearly or before storage

1. Start the engine and let it run five minutes. This warms the oil so it drains better.

2. Park the machine so that the drain side is slightly lower than the opposite side to ensure that the oil drains completely.
3. Place one end of a hose on the drain valve and the other end in a pan (Figure 20).

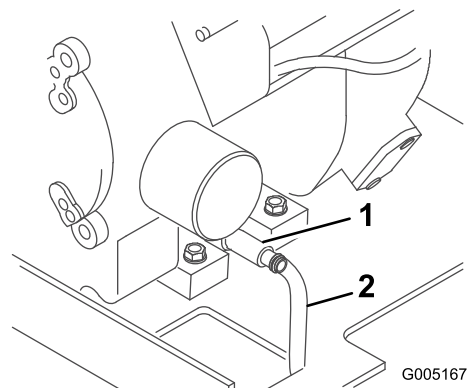


Figure 20

1. Oil drain valve
2. Hose

4. Open the drain valve by turning it counterclockwise, pulling out as you turn it (Figure 20).
5. When the oil has drained completely, close the drain valve by pushing in and rotating clockwise, and remove the hose. Wipe up any spilled oil.

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

6. Remove the old filter and wipe the filter adapter gasket surface (Figure 21).

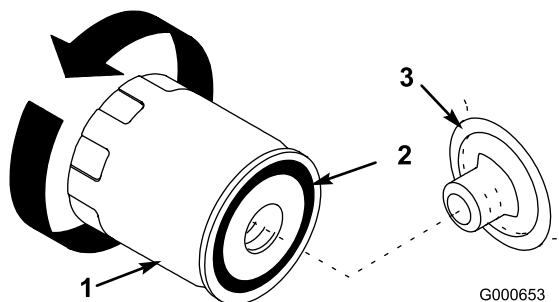


Figure 21

1. Oil filter
2. Gasket
3. Adapter

7. Pour new oil of the proper type in through the center hole of the filter. Stop pouring when the oil reaches the bottom of the threads.
8. Allow a minute or two for the oil to be absorbed by filter material, then pour off the excess oil.
9. Apply a thin coat of new oil to the rubber gasket on the replacement filter.
10. Install the replacement oil filter to the filter adapter. Turn the oil filter clockwise until the rubber gasket contacts the filter adapter, then tighten the filter an additional 3/4 turn.

11. Remove the oil fill cap and slowly pour approximately 80% of the specified amount of oil in through the valve cover (Figure 9).
12. Check the oil level; refer to [Checking the Engine Oil Level](#) (page 12).
13. Slowly add additional oil to bring the level to the F (full) mark on the dipstick.
14. Replace the fill cap.

Servicing the Spark Plug

Service Interval: Every 200 hours—Check the spark plugs.

Every 500 hours

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

Type: Champion XC12YC (RFI type) or equivalent

Air Gap: 0.030 inch (0.76 mm)

Removing the Spark Plug

1. Pull the wires off of the spark plugs (Figure 22).

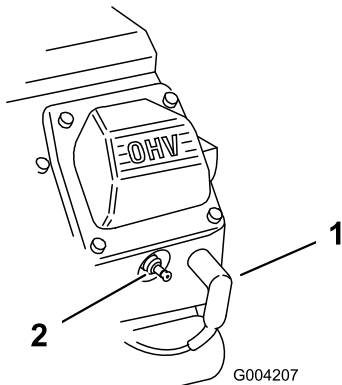


Figure 22

1. Spark plug wire
2. Spark plug

Checking the Spark Plug

1. Look at the center of the spark plug (Figure 23). If you see light brown or gray on the insulator, the engine is operating properly. A black coating on the insulator usually means that the air cleaner is dirty.

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

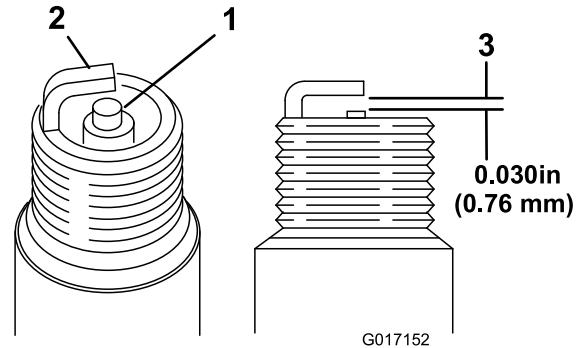


Figure 23

1. Center electrode insulator
2. Side electrode
3. Air gap (not to scale)

2. Check the gap between the center and side electrodes (Figure 23). Bend the side electrode (Figure 23) if the gap is not correct.

Installing the Spark Plug

1. Thread the spark plug into the spark plug hole.
2. Tighten the spark plug to 18–22 ft-lb (24.4–29.8 N-m).
3. Push the wire onto the spark plug.

2. Clean around spark plugs.
3. Remove the spark plugs and the metal washers.

Fuel System Maintenance

Changing the Fuel Filter

Service Interval: Every 200 hours

1. Clamp the fuel line between the carburetor and the fuel filter to block the fuel flow.
2. Squeeze the ends of the hose clamps together and slide away from the fuel filter (Figure 24).

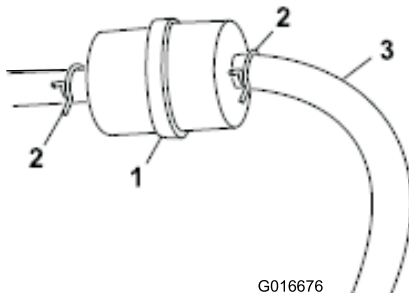


Figure 24

1. Fuel filter
2. Hose clamp
3. Fuel hose

3. Place a drain pan under the fuel lines to catch any leaks, then remove the filter from the fuel lines (Figure 24).
4. Install a new filter, with arrow pointing toward the carburetor, and move the hose clamps close to the filter.
5. Remove the clamp blocking fuel flow.

Belt Maintenance

Adjusting the Drive Belt Tension

Service Interval: Before each use or daily—Check the drive belt tension.

Note: Inspect the drive belt tension by inserting a metal scale through the slot on top of the belt cover (Figure 25) and pressing down on the scale with a force gage. The force should measure $15 \pm .75$ lbs (6.5–7.5 kg) at 0.40 inch (1cm) belt deflection. Adjust as required.

1. Remove the bolts and washers securing the belt guard to machine.
2. Remove the belt guard (Figure 25).

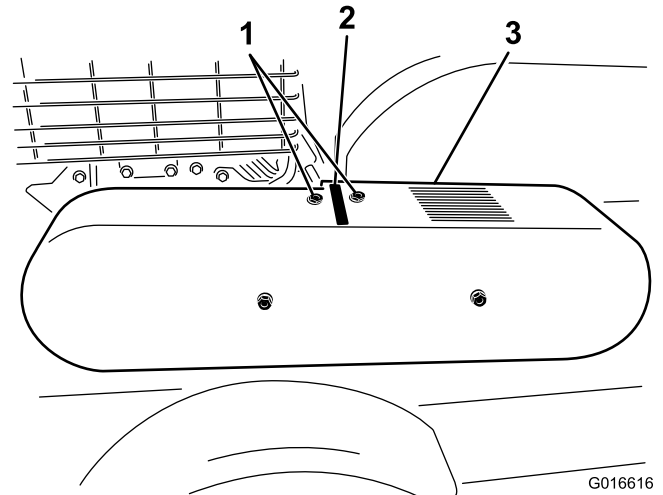


Figure 25

1. Bolts and washers
2. Slot in belt guard
3. Belt guard

3. Loosen the 4 engine plate mounting bolts and the 4 bolts securing the rear of the belt guard to the engine.
4. Loosen the belt tension bolt and jam nut (Figure 26).

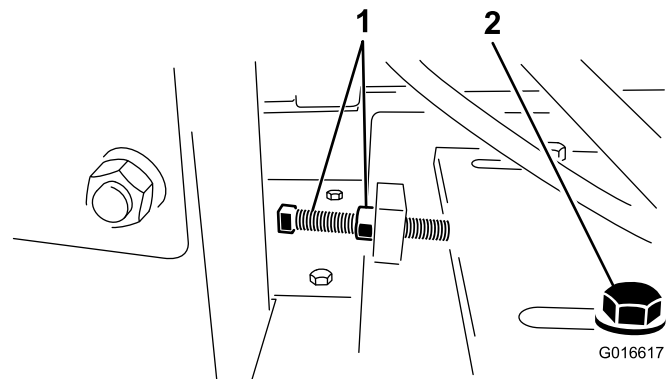


Figure 26

1. Tension bolt and jam nut
2. Engine plate mounting bolt

- Adjust the drive belt tension by loosening the jam nut and tightening the tension bolt against the engine mounting plate, pushing the engine rearward.
- Lay a straightedge across clutch and flywheel pulleys, tighten belt tension bolt so there is 0.40 inch (1 cm) of flex in the belt when pushing down with 15 lbs (6.8 kg) force, at mid-span (when re-tensioning a belt in use) or with 18 lbs (8 kg) force when installing a new belt (Figure 27).

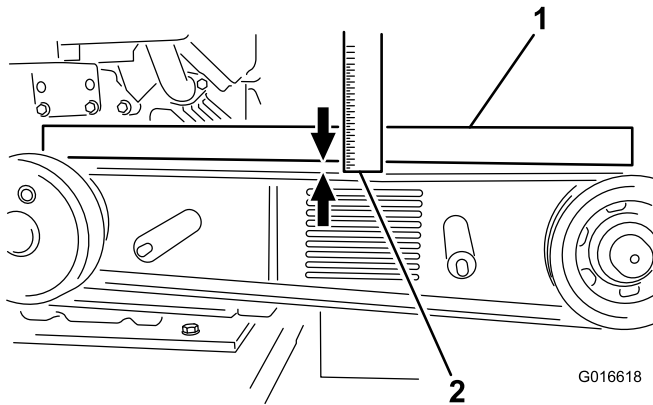


Figure 27

1. Straightedge
2. Flex of 0.40 inch (1 cm)

- Ensure that the pulleys are aligned and the engine is parallel with the frame (not angled toward the side), then tighten the 4 engine plate mounting bolts, the 4 bolts securing the rear of the belt guard to the engine, and the jam nut.
- Install the belt guard and secure it with the previously removed washers and bolts.

Replacing the Drive Belt

Service Interval: Every 100 hours

Note: Replace the belt if it shows any signs of wear, cracks, glazing, or damage.

- Remove the bolts and washers securing the belt guard to machine.
- Remove the belt guard (Figure 25).
- Loosen the 4 engine plate mounting bolts and the 4 bolts securing the rear of the belt guard to the engine.
- Loosen the belt tension bolt and jam nut, slide the engine toward the flywheel housing to loosen belt (Figure 26).
- Replace drive belt.
- Adjust tension of new belt to 18 ± 0.9 lb (7.8–8.6 kg) force at 0.40 inch (1 cm) belt deflection at mid-span.
- Tighten the 4 engine plate mounting bolts, the 4 bolts securing the rear of the belt guard to the engine, and the jam nut.
- Install the belt guard and secure it with the previously removed washers and bolts.

Cutter Maintenance

Inspecting the Cutter Block

Service Interval: Before each use or daily

Make sure the cutter block has a crisp edge and is no farther than 1/8" (3.2 mm) away from the blade. If the cutter block is worn or chipped it should be replaced (Figure 28).

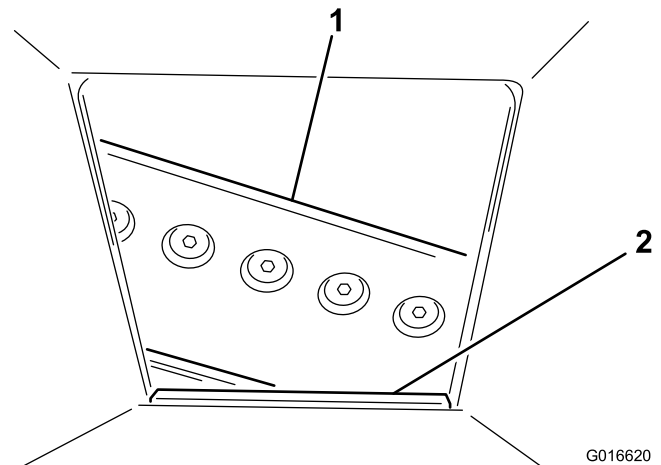


Figure 28

1. Blade
2. Cutter Block

Replacing the Cutter Blades

Service Interval: Before each use or daily—Inspect the cutter blades.

Note: Using a dull blade will decrease performance and cause excessive vibrations that will cause damage to the Brush Chipper or engine.

- Remove the bolt and washer securing the flywheel housing cover, swing it forward to expose the flywheel.
- Rotate the flywheel using a stick until the bolts and lock nuts attaching the cutter blades to the flywheel are accessible (Figure 29).

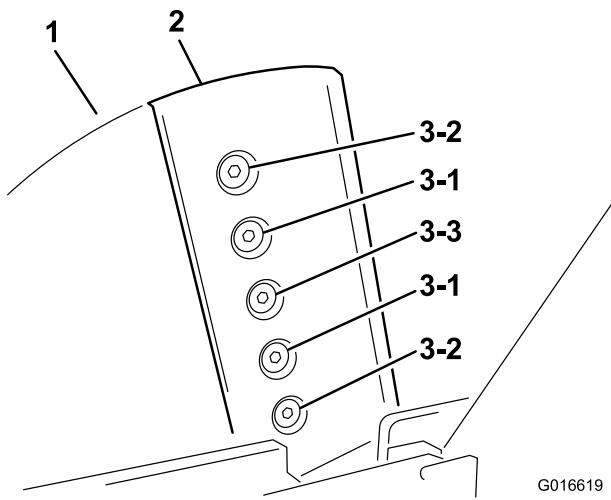


Figure 29

1. Flywheel
2. Blade
3. Sequence for tightening (3-1, 3-2, 3-3)

3. Remove the dull or damaged cutter blades and visually inspect the flywheel slots. The blade mounting areas must be clean so the replacement blades will mount flush against the flywheel.

Important: It is very important to consistently maintain the 35-degree angle for proper chipping performance.

4. Reverse the blade to use the second sharp edge, or install new or sharpened blades and finger tighten the bolts and lock nuts to hold the blades to the flywheel.
5. Tighten the center bolts and nuts first, then tighten the outer bolts and nuts, and finally tighten the inner bolts and nut. See sequence for tightening (Figure 29).
6. Torque the blade bolts to 43-53 ft-lb (58-72 N-m).
7. Scrape any sap, mulch, and dirt from inside the top cover of the housing to prevent the flywheel from rubbing on it or was the same way as the cutting chamber.

Charging the Battery

Important: Always keep the battery fully charged (1.265 specific gravity). This is especially important to prevent battery damage when the temperature is below 32F (05C).

Charging the battery produces gases that can explode.

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

1. Remove the battery cover.
2. Clean the top of the battery with a paper towel.
3. Charge the battery for 10 to 15 minutes at 25 to 30 amps or 30 minutes at 4 to 6 amps. Do not overcharge the battery (Figure 30).

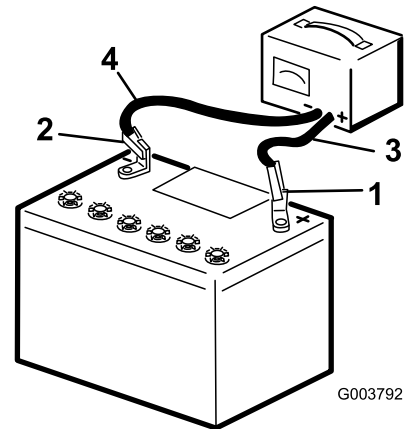


Figure 30

1. Positive battery post
2. Negative battery post
3. Red (+) charger lead
4. Black (-) charger lead

4. When the battery is fully charged, unplug the charger from the electrical outlet, then disconnect the charger leads from the battery posts (Figure 30).
5. Install the battery cover.

Inspecting the Tires

Service Interval: Every 100 hours

Note: Failure to maintain correct pressure may result in tire failure and loss of control resulting in serious injury and property damage.

- Operating accidents can damage a tire or rim, so inspect tire condition after an accident.
- Check the tire pressure frequently to ensure proper inflation. If the tires are not inflated to the correct pressure, the tires will wear prematurely.
- Always replace worn or damaged tires with DOT approved tires.
- Locate the DOT tire identification numbers (Figure 31).

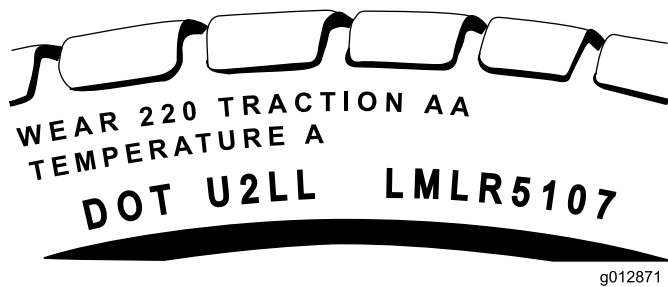


Figure 31

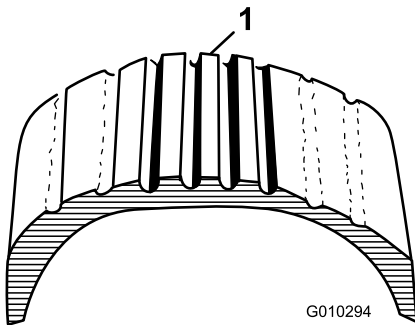


Figure 32

Example of a tire wear caused by under inflation.

1. Under inflated tire

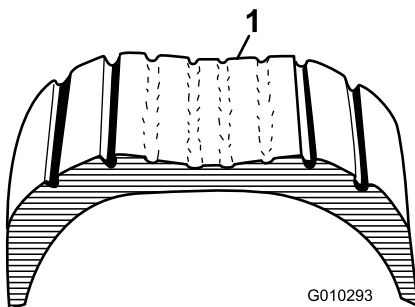


Figure 33

Example of a tire wear caused by over inflation.

1. Over inflated tire

Storage

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. 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).

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

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

3. Run the engine to distribute conditioned fuel through the fuel system (5 minutes).
4. 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.
5. Start the engine and run it until it stops.
6. Choke the engine.
7. Start and run the engine until it will not start again.
8. Change the fuel filter; refer to [Changing the Fuel Filter \(page 19\)](#).
9. Service the air cleaner; refer to [Servicing the Air Cleaner \(page 16\)](#).
10. Change the engine crankcase oil; refer to [Changing the Engine Oil \(page 17\)](#).
11. Remove the spark plug and check the condition; refer to [Servicing the Spark Plug \(page 18\)](#).
12. With the spark plug removed from the engine, pour two tablespoons of engine oil into the spark plug hole.
13. Pull the starter slowly to crank the engine and distribute the oil inside the cylinder.
14. Install the spark plug, but do not install the wire on the spark plug.
15. Check and tighten all bolts, nuts, and screws. Repair or replace any part that is damaged.
16. Paint all scratched or bare metal surfaces. Paint is available from your Authorized Service Dealer.
17. Store the unit in a clean, dry garage or storage area.
18. Cover the unit to protect it and keep it clean.

Troubleshooting

Problem	Possible Cause	Corrective Action
The engine will not start.	1. The choke is open. 2. The fuel tank is empty. 3. The spark plug wire is loose or disconnected.	1. Close the choke when starting a cold engine. 2. Fill the tank with fresh fuel. 3. Check the electrode gap and clean or replace the spark plug.
The engine runs rough.	1. The choke is left on. 2. The air filter is clogged. 3. The fuel line is clogged. 4. There is water or contaminants in the fuel. 5. The spark plugs are worn or have buildup on the electrodes.	1. Open the choke. 2. Clean or replace the air filter. 3. Clean the sediment cup. 4. Drain and fill the tank with fresh fuel. 5. Check the electrode gap and clean or replace the spark plug.
Chipping action seems slow or the flywheel is stalling.	1. The engine speed is too slow causing the clutch to slip. 2. Check for a loose or damaged drive belt. 3. Check for dull or damaged blades. 4. The clutch shoes are worn.	1. Run the engine at full throttle. 2. Tighten or replace the drive belt. 3. Replace with sharp blades. 4. Replace the clutch.
The flywheel does not rotate.	1. Build-up of chips and debris around flywheel. 2. The belt is loose or damaged. 3. The clutch overheated, is damaged, or the shoes are worn.	1. Clean out the build-up of chips and debris around the flywheel, on the outer diameter of the wheel, upper lid of the grinder, and inside the housing cover. 2. Check the drive belt. 3. Replace the clutch.
Drive belt is worn, burned, or jumps off of pulley.	1. Improper drive belt adjustment. 2. The drive belt may be stretched. 3. Pulleys are out of alignment.	1. Check the drive belt tension. 2. Replace the drive belt. 3. Align the engine/clutch pulley with flywheel.
The machine has excessive vibration.	1. Check for dull or damaged blades. 2. Blades may not be properly seated on the flywheel. 3. Gap between the blades and cutter block is too great.	1. Replace with sharp blades. 2. Loosen the blade mounting screws, reset the blades and tighten the screws. 3. Adjust the flywheel position in the housing to attain a 1/8 inch (3 mm) clearance between the blade and cutter block.



Toro Compact Utility Equipment Warranty

A One-Year Limited Warranty

CUE Products

Conditions and Products Covered

The Toro® Company and its affiliate, Toro Warranty Company, pursuant to an agreement between them, jointly warrant your Toro Compact Utility Equipment ("Product") to be free from defects in materials or workmanship. The following time periods apply from the date of purchase:

Products	Warranty Period
Loaders, Trenchers, Stump Grinders, Chippers, Log Splitters and Attachments Kohler Engines	1 year or 1000 operating hours, whichever occurs first
All other Engines	3 years
	2 years

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

Instructions for Obtaining Warranty Service

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

1. Contact any Authorized Toro Compact Utility Equipment (CUE) Service Dealer to arrange service at their dealership. To locate a dealer convenient to you, access our website at www.Toro.com. You may also call our Toro Customer Care Department toll free at 888-865-5676 (U.S. customers) or 888-865-5691 (Canadian customers).
2. Bring the product and your proof of purchase (sales receipt) to the Service Dealer.
3. If for any reason you are dissatisfied with the Service Dealer's analysis or with the assistance provided, contact us at:

LCB Customer Care Department
Toro Warranty Company
8111 Lyndale Avenue South
Bloomington, MN 55420-1196
Toll Free: 888-865-5676 (U.S. customers)
Toll Free: 888-865-5691 (Canada customers)

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, teeth, tines, blades, spark plugs, tires, tracks, filters, chains, etc.
- Failures caused by outside influence. Items considered to be outside influence include, but are not limited to, weather, storage practices, contamination, use of unapproved coolants, lubricants, additives, or chemicals, etc.
- Normal "wear and tear" items. Normal "wear and tear" includes, but is not limited to, worn painted surfaces, scratched decals or windows, etc.
- Any component covered by a separate manufacturer's warranty
- Pickup and delivery charges

General Conditions

Repair by an Authorized Toro Compact Utility Equipment (CUE) Service Dealer is your sole remedy under this warranty.

Neither The Toro® Company nor Toro Warranty Company is liable for indirect, incidental or consequential damages in connection with the use of the Toro Products covered by this warranty, including any cost or expense of providing substitute equipment or service during reasonable periods of malfunction or non-use pending completion of repairs under this warranty. 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). The hour limitations set forth above do not apply to the Emissions Control System Warranty. 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 exported from the United States or Canada should contact their Toro Distributor (Dealer) to obtain guarantee policies for your country, province, or state. If for any reason you are dissatisfied with your Distributor's service or have difficulty obtaining guarantee information, contact the Toro importer. If all other remedies fail, you may contact us at Toro Warranty Company.