



Powered Hand Tools Safety

2015

Overview

- In 1989 the U.S. Consumer Product Safety Commission reported that power lawn trimmers and edgers alone have caused about 4,600 injuries annually that required medical attention. About one-third of these were eye-related.

- String trimmers are known to throw stones, sticks, and other objects at high speeds. Lawn edgers with metal blades are capable of cutting through underground objects, splintering concrete, and causing sparks. Heavy hedge trimmers are known to cause accidents — particularly when operators are fatigued.

Leaf blowers produce considerable noise, and they also throw small rocks and other objects at high speeds.



Special care must be taken to prevent these types of accidents.

General Safety Rules

- Read and understand the operators manual prior to operating power tools.
- Do not allow children to operate power tools.
- Make sure there are no bystanders, children, or pets within a 50-foot radius.
- Wear eye and ear protection equipment when operating power tools.

General Safety Rules

- Wear protective clothing. Long pants, closed-toe shoes, and gloves are recommended. Do not wear loose clothing or jewelry.
- Inspect the area where the power tools are to be used. Remove all stones, sticks, wire, and other foreign objects that could interfere with the operation and cause personal injury.
- Do not operate any power tool while under the influence of alcohol, medications, or drugs or when ill or fatigued.

- Never start a gasoline-powered tool inside an enclosed area. **Breathing exhaust fumes can be fatal.**
- Follow fueling and premixing guidelines strictly. Wipe up any fuel spillage and replace the fuel cap immediately to minimize potential for fuel contamination and explosion.
- Never leave power equipment unattended with the engine running.

Remember that for all power equipment a “safety always” attitude is the best defense against accidents and injuries.



String Trimmers

A string trimmer — also known as a line trimmer, weed whacker, weed whip, or weed eater — is a hand-held device that uses a flexible monofilament line for cutting grass and similar plants around stationary objects.

It consists of a cutting head on one end of a long shaft and a handle or handles on the other. Sometimes these trimmers come with a shoulder strap. They are usually powered by either an internal combustion engine or an electric motor.

Gasoline-Powered Trimmers

If the trimmer is powered by a gasoline engine, it will be located on the opposite end of the shaft from the cutting head. The capacity of these engines on string trimmers may range from 21 cc to 32 cc. Trimmers with small engines use 2 mm (0.08 inch) lines or nylon blades. On the other hand, trimmers equipped with larger engines may be able to operate 2.75 mm (0.11 inch) lines or metal blades.

Gasoline Powered Trimmers

All trimmer heads are equipped with safety shields to protect the user. If the power units are two-cycle engines, they run on a gasoline-oil mix.

All gasoline-powered trimmers are heavy and expose the operator to considerable vibration.

The primary advantage is freedom to move around and cover a larger work area.

Electric Trimmers

Electric trimmers are relatively light and easy to operate. However, they lack flexibility, and the length of the power cord limits the area that can be covered. They are also generally less powerful and less robust than gasoline-powered trimmers. Because of their low power output (400 to about 1,200 watts), the lines on electric trimmers are limited to 2.5 mm (0.10 inch). However, the performance of newer models of electric string trimmers matches that of gasoline powered trimmers.

Battery-Powered Trimmers

Battery-powered trimmers are also available. While these provide flexibility in terms of free movement, their weight and battery life (between charging) limit their acceptance and use.

Lithium-ion batteries are recommended for extending the run time of battery-operated trimmers.

Safety with String Trimmers

Inspect the trimmer for loose fasteners, fuel leaks, and for cracked or chipped string head before use.

Replace all damaged parts and tighten all the loose parts.

Secure long hair above the shoulder while operating a string trimmer.

Maintain balance and firm footing.

Avoid overreaching and always keep the string head below waist level.



- Use the string trimmer only for grass and similar weeds.
- Watch for exposed electrical wires, communication lines, and extension cords to avoid damaging them.
- Do not remove protective guards and string guides.
- Check the trimmer string length periodically. Automatic-feed and bump-feed trimmers may release more string than needed. This increases the chances of striking the operator.

- Inspect power cords on electric trimmers for cuts, nicks, or scrapes. Replace damaged cords immediately.
- Do not operate electric trimmers in wet conditions.
- Unplug electric trimmers and turn off gas-powered trimmers for inspection, repair, and maintenance.

Lawn Edgers

- A lawn edger is a garden tool used to separate a lawn from a walkway or other paved surfaces, such as concrete sidewalks or asphalt paths.
- Edgers may be manual or mechanical.
- Mechanical edgers are powered either by a small two-cycle gasoline engine or by an electric motor.

Gas Powered Edgers

- Gas-powered string lawn edgers were originally developed for commercial use. They are powered by two-cycle engines and weigh 14 to 25 lbs. Lighter versions are now available for non-commercial use. Optional accessories may include blade attachments for other lawn and garden uses.

Electric-Powered Edgers

- Smaller models weigh approximately 3 lbs. and generate about 0.10 to 0.125 horsepower with a cutting depth of 7 – 12 inches.
- Larger units with 0.75 horsepower and weighing 4 to 8 lbs. can handle larger cutting lines (0.06 inch) and can cut swaths up to 16 inches wide.
- Larger units come with an second adjustable assist handle for better control.
- Wider cutting radius and additional power allow for handling larger jobs.

Safety With Lawn Edgers

- Check and make sure the edger blade and other parts are firmly attached. The blade should rotate freely without touching the housing.
- Do not use a lawn edger on gravel surfaces.
- Do not operate a lawn edger without protective guards in place.
- Do not start an edger with the blade in contact with the ground so as to avoid uncontrolled movement and possible injuries.

- Watch for exposed electrical wires, communication lines, and power cords that could be struck by the edger.
- Operate the edger at full blade speed.
- Stay close to the curb to avoid accidents when edging along the roadways.
- Never leave a lawn edger running while unattended.
- Do not inspect, repair, or carry out maintenance work on a lawn edger with its power unit running

Hedge Trimmers

- Hedge trimmers are used for trimming and shaping plants with ease and efficiency. Powered hedge trimmers are faster and easier to operate than pruning manually with knives or shears. Their cutting mechanism is similar to that of finger-bar mowers. One of the safety features of the powered trimmer is that it operates only when the operator holds it with both hands.



Gas-Powered Hedge Trimmers

- More powerful than electric trimmers.
- Heavier and harder to start.
- Allows you to cover large area with no cord.

Electric Hedge Trimmers

- Lighter
- Less polluting
- Less powerful
- Long electrical cord required, and care must be taken to not cut into the cord.

Safety With Hedge Trimmers

- Check the hedge trimmer before use to ensure that all safety features are functioning as they should and there are no loose parts.
- Keep hands away from blade.
- Wear a dust mask to prevent inhalation of dust or smoke.
- Grip the hedge trimmer properly to avoid unwanted body stress. Maintain control without using an excessively tight grip.

- Make sure all screws, blades, or chains are secure.
- Vibrating equipment may loosen fasteners.
- Keep power cords away from the blades.
- Disconnect and shut down the hedge trimmer before inspection, repair, and maintenance.
- Do not leave a running hedge trimmer unattended.
- Never use an electric hedge trimmer overhead.
- If the trimmer becomes lodged, disconnect the power before trying to dislodge it.

Gas-Powered Hedge Trimmer Dangers

- Make sure fuel cap is tightly in place to avoid spillage and fire.
- Do not refuel when engine is hot to avoid possible spill and fire.
- Gas-powered trimmers are heavy and may cause operator fatigue.
- Never run a gas-powered hedge trimmer in an enclosed area to avoid carbon monoxide poisoning.

Electric Hedge Trimmer Dangers

- Always tract the power cord to avoid cutting into it.
- Always use ground fault circuit interrupter, GFCI, grounded outlets.
- Never operate in wet conditions.
- Avoid coming in contact with the cord to avoid electric shock.

Leaf Blowers

- Used to collect leaves and yard debris
- Powered by either two-stroke engine or electric motor.
- Four-stroke engines are being introduced to reduce air pollution.
- Can be hand-held or back-mounted.
- Some can vacuum and shred when the operation is reversed.

Hand-Held Electric Blowers

- Usually weigh about 7 lbs. or less
- Designed for one-handed operation
- Push-button start, emission-free
- Disadvantage is the cord
- Battery-powered units are heavier
- Battery-powered units are limited by the length of the battery

Hand-Held Gas Blowers

- Designed for one-handed operation
- Provide maximum flexibility
- Heavier than electric, weighing 7 – 12 lbs.
- Usually two-cycle engines that run on mixture of gas/oil
- Ear protection is highly recommended.

Back-Mounted Gas Blowers

- More powerful
- Can only act as blowers
- Back- or shoulder-mounted
- Used in commercial applications
- Weigh approximately 15 – 25 lbs.
- More expensive than hand-held
- Ear protection is suggested.



Wheeled Gas Blowers

- Particularly designed to cover large areas
- Only capable of blowing
- Four-cycle engine runs on regular fuel.
- Bulky, hard to maneuver
- Weigh over 100 lbs.
- Ear protection necessary.



Safety with Leaf Blowers

- Have a first aid kit available.
- Store and handle fuel with care. Extremely flammable.
- Do not use blower to clean debris off of yourself.
- Be aware of pedestrians and others in the area.
- Inspect extension cords prior to use. Replace damaged cords immediately.
- Do not operate electric blowers around water puddles or during wet conditions.

Garden Tillers

- A garden tiller is a motorized machine that is generally used to loosen and turn the soil with the help of rotating blades. Most garden tillers are powered with small gasoline engines. They are used widely for preparing seedbeds and for cultivation.

Front-Tine Tiller

- Tines are located in the front.
- Disadvantage in hard, untilled soil.
- Skips over hard part without tilling those areas.
- Best choice for less than 5,000 sq. ft. with loose soil



Mini-Tiller or Cultivator

- Lightweight, wheels not necessary
- Excellent for small gardens with soft soils
- Designed to till 6 in. wide strips between rows.
- Works well in raised beds.
- Ideal for keeping weeds down in long vegetable rows



Rear-Tine Tillers

- Best among tillers
- Weigh as much as 200 pounds
- Tines located behind the engine
- More difficult to maneuver
- Well-suited for larger operations with hard soil.
- Often equipped with push-button start and various accessories



Safety With Garden Tillers

- Disengage tiller tines before starting the engine.
- Never leave a garden tiller unattended with the engine running.
- Never attempt to make any adjustments while the engine is running unless it is specifically recommended in the operators manual.
- Use only the attachments and accessories recommended by the manufacturer. Failure to do so may result in personal injuries.

- Be familiar with all the controls and their functions. Know how to stop and disengage the tiller quickly.
- Use caution when tilling near fences, buildings, and underground utilities. Rotating tines can cause property damage or personal injury.
- Do not overload the tiller by tilling too deeply or at a high speed.
- If the tiller experiences excessive vibration or it makes unusual noise, turn the engine off and disconnect the spark plug wire before inspecting or repairing the unit.

Acknowledgements

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- You may now finish this safety training tutorial by completing the [OSHA Assessment Quiz](#).