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Equipment Maintenance and Troubleshooting *for the Landscape and Garden*

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Gardening and landscape equipment can be an expensive investment for both consumers and professionals. However, quality equipment can last a lifetime when cared for properly. Typically, you get what you pay for when it comes to equipment. Higher quality equipment certainly costs more upfront, but usually has fewer problems and will tend to outlast bargain-type tools. With name-brand equipment, parts also tend to be more readily available. We recommend that you purchase the best equipment you can afford and learn how to take proper care of your equipment to protect your investment.

Hand Equipment

Depending on the frequency of use, equipment may need daily attention. Hand tools such as shovels and rakes last much longer if they are cleaned at the end of the day and given a light coating of a tool oil. Fiberglass handles rarely need attention, but wooden handles on equipment should be coated with either boiled linseed oil or tung oil to help preserve the wood. Another alternative is to spray-paint wooden handles with an outdoor paint to protect them from damaging sun rays. Hand pruners should be of the highest quality and kept razor sharp. A small mill file or sharpening stone can be used to keep the edges cutting cleanly.

Motorized Equipment

For the garden and landscape, motorized equipment can include everything from a string trimmer to a full-size garden tractor. Modern small engines are designed to run at high RPMs and produce amazing power for their size. Most garden equipment is powered by either a two-cycle or four-cycle engine. Two-cycle motors mostly are found on smaller handheld equipment, such as chainsaws, tillers, and trimmers. These two-stroke motors require a mixture of fuel and special two-cycle oil. They do not have a separate reservoir for motor oil. Four-cycle motors typically are found on larger equipment such as lawnmowers, tillers, and garden tractors, which have separate reservoirs for their gas and engine oil. When properly maintained, both types of motors are quite reliable. When maintenance is neglected, small motors can be a giant headache. Sometimes, very basic issues may keep motors from functioning well. All motors require three basic things to run properly: fuel, fire, and air. If any one or more of these three elements is lacking, the engine will either run poorly or not run at all.

The following steps can help make sure motorized equipment is working properly.

- Check the engine oil to make sure it is at the proper level—either daily or each time the equipment is used. Engine oil should be changed once a year in your garden equipment. Be sure to reference your owner’s manual for the oil capacity and type.
- Fill two-cycle motors with fresh fuel mixed at the proper gas-to-oil ratio. Failure to do so can cause them to run poorly.
- Inspect the air breather, and clean or change the filter as needed.
- Check tire air pressure, if equipped.
- Inspect blades or chains on cutting equipment for sharpness and damage. When sharpening blades, maintain the same angle created by the manufacturer. Adjust chain tension on chainsaws so that there is about 1/8 in. of play on the bar.



Figure 1. Engine oil should be checked every time before you use your motorized equipment.

Winterizing Motorized Equipment

Winterizing is a term often used when motorized equipment will be stored for an extended period (at least 3 or 4 weeks without using the engine). This may occur during the winter, summer, or any other time of year. One of the biggest issues with small motors is the ethanol fuel supply that is available at gas pumps. Ethanol is an additive product that is normally plant-based and used to extend the fuel supply. The ethanol component in most gasoline will break down the rubber components of small engines, which often leads to problems with the carburetor and fuel lines in small motors. For these reasons, use ethanol-free fuel if it’s available. If you cannot find ethanol-free fuel locally, many stores that sell two-cycle equipment also sell preblended fuel. If ethanol gasoline is your only option, you can purchase commercially available fuel stabilizers that can eliminate the issues that are caused by ethanol. Remember that nontreated ethanol fuel left sitting in a gas tank for an extended period will react with the engine’s rubberized components. This can cause the carburetor to clog and fuel lines to crack. This ultimately results in poorly running or nonfunctional equipment and leads to extensive downtime and expensive repairs.

The following steps should be considered when small engines are to be stored for an extended period:

- Empty the entire tank of fuel into an approved container.
- After the fuel is out of the tank, crank the motor several times to empty the remaining fuel from the carburetor. This type of dry storage is the best way to ensure fewer problems when it comes to restarting the motor.
- Check the general condition of your equipment in addition to emptying the fuel (e.g., air filter, spark plug, wheels, handles, cables, blades, etc.).
- Check or change the oil.
- Follow the guidelines of your service manual and lubricate or grease any parts that require it.
- Sharpen the blades of lawnmowers, chainsaws, and hedge trimmers so they are ready to go the next time you need them.
- Check tires for the proper inflation level, if applicable.

Basic Troubleshooting

When an engine either will not crank or runs poorly, the issue normally is one of three things discussed earlier: fuel, fire, or air.

Air

Small engines run primarily on air and a small percentage of fuel. When air is restricted, the engine may run poorly or not crank at all. Air is introduced into the motor through the breather on the carburetor. Carburetors typically have a filter that prevents dust and other debris from entering the fuel system. When a filter element becomes excessively clogged with dirt, the engine will run poorly and may stall often. Filters should be inspected frequently and either cleaned with liquid detergent and water or replaced as needed. Foam filters can be sprayed with a very light coating of a household oil to make them more effective in catching dust. Small engines often also have a spark-arrestor filter located on or inside the muffler. This also can become clogged and keep the engine from running properly. Check this filter often, especially when working in dusty conditions.



Figure 2. Air breathers should be cleaned on a regular basis by using either compressed air or soap and water on foam elements.



Figure 3. Some mufflers contain spark screens, which must be kept clean to allow for the exhaust flow.

Fire

The electric current that is generated by a turning motor causes a spark (fire) to arc across the spark plug gap and ignite the fuel vapors. If any of these components are faulty, the engine cannot be started. If the motor will not start, check to make sure the spark plug is in good condition. The spark plug can be removed with a deep socket wrench or with a wrench provided by the manufacturer. Spark plugs should be free from oil or corrosion, and should be checked for extensive wear, cracked porcelain jackets, and proper gapping. You can test to see if a spark is present by purchasing a small spark plug tester that illuminates when the cord is pulled. You also can try spraying a small amount of starter fluid into the open-air breather. If a good spark is present, it will ignite the starter fluid and the motor should at least attempt to start. Replace the spark plug if you notice any problems with it.

If the spark plug is new or in good condition and there is still no spark, you may have an issue with the coil or coil wire. Coils may occasionally break or crack, and the wire that connects to the spark plug may also become damaged. If any of these problems are present, replace the coil. Be sure to follow manufacturer's directions, as the coil and the flywheel need to be spaced apart properly. The flywheel has a series of magnets embedded into its sides. When the engine is running, the spinning magnets work together with the coil to create a current, which creates the spark across the spark plug gap. Sometimes the flywheel may become rusted or dirty, which makes it difficult to produce a current. In this case, flywheels should be cleaned with a light emery cloth or fine sandpaper.



Figure 4. Ignition tester used to check spark plugs.



Figure 5. New spark plugs must be set to the proper gap using a spark plug gauge tool.

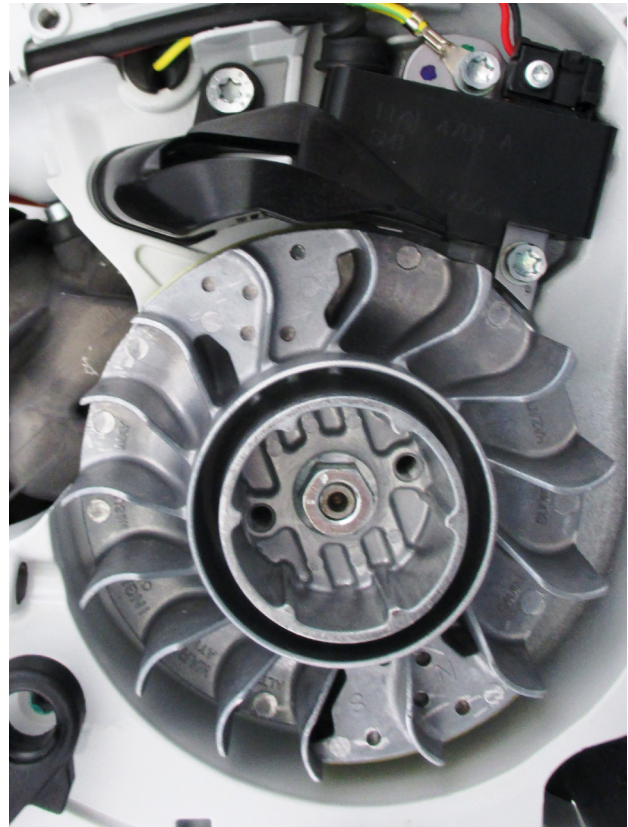


Figure 6. All components of the ignition system should be kept clean and free from any damage. This includes the coil, the flywheel (shown here), and the spark plug.

Fuel

If air or fire is not the issue, then fuel most likely is the problem—either a lack of fuel or contaminated fuel can keep most small motors from running properly. Most fuels today contain ethanol. Ethanol makes fuel unstable, and it clogs small jets in carburetors if it sits for a long period of time. Ethanol also dries out and cracks fuel lines and plastic primer bulbs, which makes frequent inspections of these pieces necessary. A cracked fuel line or primer bulb will introduce air into the system and make the motor run poorly, if it runs at all.

If a fuel problem is suspected, empty the existing fuel into an approved container. Refill the tank with fresh, ethanol-free fuel or fuel that is treated with a stabilizer. Try to crank the motor with the new fuel, using a little starter fluid if needed to help fire the motor.

If the engine still does not start or stalls frequently, you may need to consider replacing the carburetor and fuel lines. A small-equipment repair shop can do this, or you can attempt it yourself. Replacement carburetors can be found online and are inexpensive and easy to install. You often can find videos online with information about replacing equipment parts. Replacing the carburetor and fuel lines often fixes issues with motors that run poorly or do not start.

In most two-cycle motors, there is a small fuel filter in the fuel tank. This filter, along with the fuel line connecting it to the carburetor, also should be replaced. Not doing so often causes equipment to run poorly or not at all.

Higher quality equipment generally is more reliable and lasts longer than its lower quality counterparts. Buying equipment from a local dealer also makes ordering parts and obtaining service more convenient. Regardless of what quality or brand of equipment you purchase, routine maintenance and attention to fuel is the key to keeping things running smoothly.



Figure 7. Fuel stabilizer can help prevent issues when using fuel that contains ethanol.



Figure 8. Most two-cycle motors have a small barrel fuel filter inside the gas tank. These should be changed at least once a season.

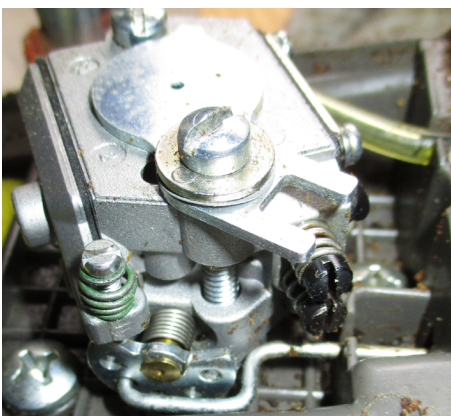


Figure 10. Changing out the carburetor can be a simple and effective way to get a small engine running again.

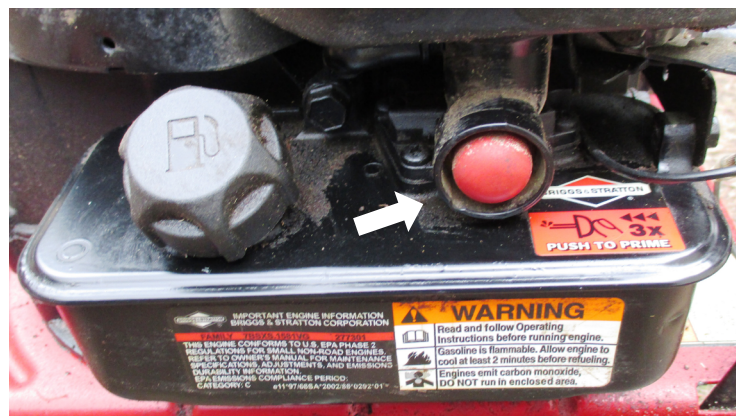


Figure 9. Some motors have a primer bulb located near the carburetor to help introduce fuel into the system prior to cranking. Inspect these bulbs routinely for cracks or drying out.

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Circular 1247

January 2023

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