

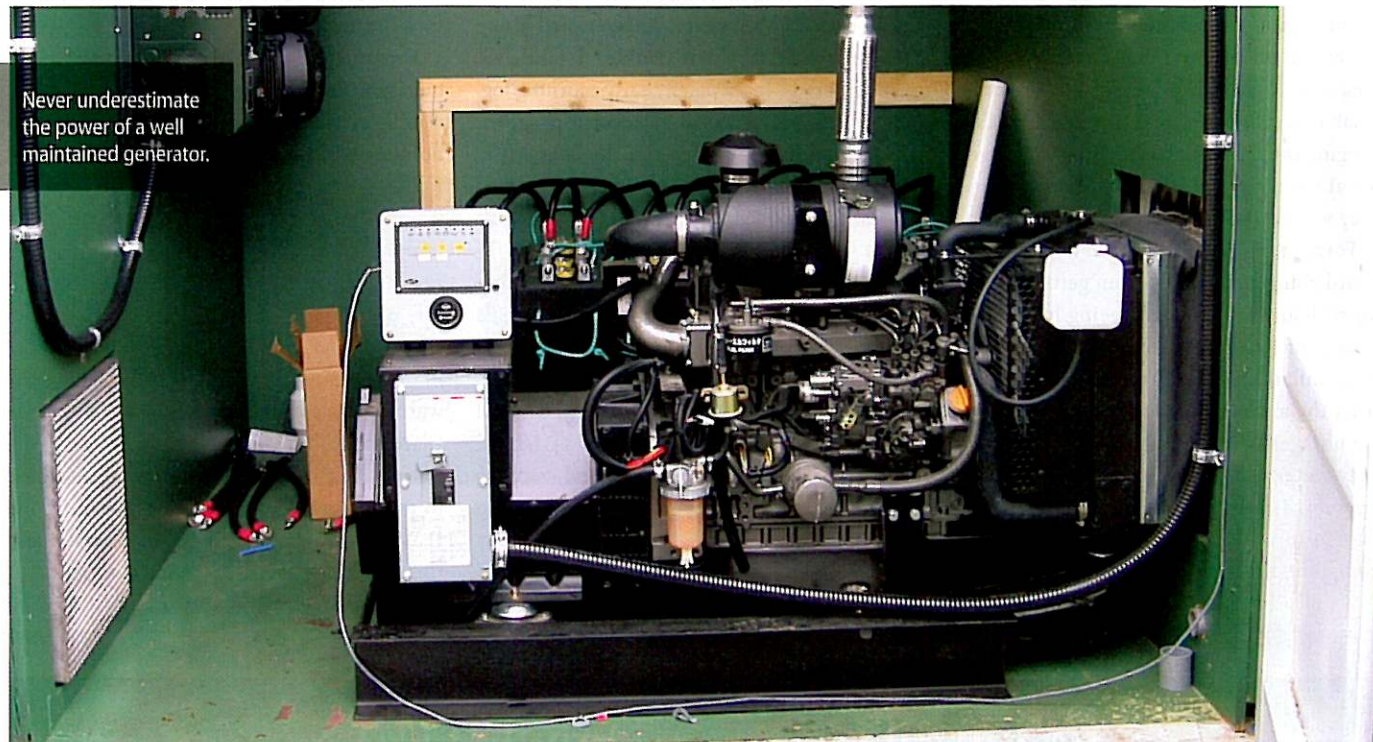
Elements

By Kevin Pegg

Generators

What to know before you buy.

Never underestimate the power of a well maintained generator.



Most people have an interesting relationship with their generator. When it's working properly, it's noisy, smelly and needs constant attention. It constantly needs replaced fuel, filters, oil or one of those "thingamajigs" that look expensive. When it's broken, the real cursing kicks in. Welcome to the world of generators.

Buying a generator is a lot like buying a vehicle. You can spend \$100 on a used beater or you can spend more than \$100,000 pretty easily. My first truck was a red 1972 GM one-tonne pickup. I paid \$100 for that rusty old truck and put 65,000 kilometres on it without any mechanical issues whatsoever. I eventually sold it to a friend for \$200. For all I know, he's still driving it. I spent \$4,000 on my next truck, but it fell apart in under a year and I spent more than the purchase price in repairs. Generators are somewhat similar: sometimes you luck out on a great deal for a used unit, but the gratification of purchasing a brand new generator can't be underestimated.

There are several key things to consider when purchasing a generator. You should have a unit that is appropriate for your needs. Too small

and it's running forever. Too large and it's not using fuel efficiently. In an off-grid world, with a properly designed system, the generator is often used for battery charging. In this configuration, it's important you have a battery charger large enough to charge your battery bank in a reasonable time and properly matched to the power output of your generator. Sites with larger power demands may also use the generator during peak loads. If you plan to run the generator to charge batteries, do your laundry, vacuum the cottage and irrigate the lawn at the same time, you need to consider this in the sizing. While it's always best to discuss your specific needs with a generator professional, let's break down the decision process into bites.

Fuel Type

Your main choices are diesel, gaseous (propane or natural gas) and gasoline. Always consider access to fuel, expected use, level of user interaction, cost and storage of fuel.

Diesels typically represent the best long-term option. It will cost more up front, no question,

but they are less expensive to operate and have very long lives. Diesel engines also open the doors to biofuels, such as biodiesel, which are becoming more popular with people looking to reduce their environmental impact. Biodiesel is cheaper to purchase than conventional diesel, but does require some special handling (most notably, it won't tolerate below-freezing temperatures). Diesels are common in a stationary format (bolted to the floor) and are heavier. Smaller, more portable-sized format diesels have become more accessible recently.

Gaseous generators will typically operate on either propane (LPG) or natural gas. The main advantage to these fuels is convenience and reduced fuel handling. Most off-grid locations will already have an existing LPG infrastructure in place — ideally a large propane tank — filled in bulk. LPG is an excellent fuel for longer-term storage. Since gaseous generators are well-known for being more finicky than diesels, it can be harder to find mechanics to work on them.

Gasoline is typically suited for smaller, portable non-automated generator systems. These

generators are the least expensive to buy, but have the highest operational costs. Within the gas generator world, there is a huge variation in price, but it has a direct correlation to quality. These machines are easy to service because you can easily transport them to your favourite small-engine mechanic.

Portable VS Stationary

This is going to depend on your situation. Portable generators have a far greater likelihood of growing legs and wondering away from your cottage. I had one client with an auto-start portable generator call me one day, confused as to why it would not start since they just had the unit serviced and everything was fine. I suggested they check the starting battery to ensure it was okay. To their surprise, they discovered a cut power cord lying on the ground with a missing generator. "But we had it chained down," they said. However, anyone with a hardware store set of bolt cutters or a hacksaw can get through most chains quickly enough.

Stationary generators are heavier units often bolted to the floor or held in place with footing. They are larger in size, typically from 10 kW to megawatt capacities for large facilities, and use the same engines commonly applied toward other applications, such as marine engines, tractors and welders. Using such a common engine makes it easier to get parts and service, which increases its life expectancy. However, you need to consider that stationary generators are usually serviced where they sit, which could alter your decision. Will you be able to get a service person to come out and fix your generator if something happens to it?

Power Quality

Power quality is directly related to price tag. The sub \$1,000 "construction specials" at lumber stores often end up being not such a good value after all. However, it all depends on what you are using them for. If you ever spend time with a no-name, Chinese-made generator, you will quickly learn how loud and smelly a generator can be.

Generators have two price tags: the purchase price and the operating costs. Often people are fooled into buying a cheap generator by the price tag alone. However, that cheap generator may use three times the amount of fuel, make three times the noise and only live a few hundred hours before it dies. Nobody wants the inconvenience of a dead generator and a cottage full of in-laws on a rainy weekend. The name-brand generator that's more expensive up front

often ends up being less costly in the end.

If you are inclined towards the Chinese no-name generators, my recommendation is to purchase three identical units. This will improve your odds that at least one of them will work for you and you can salvage parts as needed.

Inverter-Generators

Modern generators, such as the Honda EU series, are truly the best new technology in generators since the electric start. These units use a DC generator and an internal inverter to convert this DC to purely regulated AC power. Engine RPM is automatically adjusted according to the load on the generator. This feature not only results in dramatic fuel savings, but usually operates very quietly.

Automatic Start

Modern inverterchargers, such as Xantrex and Outback units, have built-in capabilities to send a start signal to the generator. This is the most efficient generator operation and a more "hands-off" approach as generator automation is programmed to your needs. If you purchase an auto-start generator, do yourself a favour and ensure it comes with this option from the factory. A two-wire start, where a switch closes the circuit and the generator has its start-up sequence, is the simplest. A three-wire start is like your car, where you have to decide how long to engage the starter, but these are more complex.

Maintenance

We all know that we need to take our vehicles in for servicing. Generators are no different. A neglected generator is one that will be less reliable and, ultimately, will let you down. Each generator has its own specific maintenance schedule, which is published in the owner's manual, so review this section. If you don't have it (or can't find it), track it down by searching the Internet or finding a distributor that sells the same brand. Set a maintenance schedule, post it on the wall by the generator and record all maintenance performed. If there are any warranty issues, you may have to prove that routine maintenance was conducted according to the manufacturer's instructions.

I like to remind people that generators have feelings, too. A loved and well-treated generator will be better behaved than a neglected, under-appreciated generator. Like a child, it often has no choice but to act up once and a while in order to get some attention. 🐾



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