

Powered With Preventive Maintenance: Longer Standby Generator Life

Written by Robert K. Breese II, Generac
Friday, 23 March 2012 10:22



Availability is priceless when it comes to emergency power.

□ **These tips and techniques can help ensure your generators□ are there for your operations whenever and wherever duty calls.**



Checking the engine oil level is one of several routine maintenance items that should be performed monthly. While the average life expectancy of a well-maintained service vehicle is approximately 5000 hours (assuming 300,000 miles at 60 mph), a typical standby generator set can last from 10,000 to 30,000 hours. On the other hand, a standby generator might operate as little as 26 hours a year (based on only 30 minutes of weekly exercise and no outages) or as much as several hundred hours a year, depending upon the number and duration of power outages.

In either case, a standby generator set could conceivably last 20 to 30 years. One way to ensure a long, reliable operating life is to implement a preventive maintenance (PM) program.

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Preventive maintenance and service are typically done on a schedule based upon engine hours and/or time periods. The maintenance cycle can—*and should*—be adapted to meet specific application needs. The more hours per year a unit operates, the more frequently it will require service. Environment also plays a role: The more severe the environment (dusty, extremely hot or cold, highly humid, etc.), the more frequent the need for service may be.

Most OEM-recommended maintenance schedules for generators—*whether a unit is powered by diesel or gaseous fuels*—are roughly the same. The typical maintenance cycle includes a general inspection followed by scheduled inspection and service of the following critical systems:

- Fuel system (diesel fuel requires more maintenance)
- Coolant system
- Lubrication system
- Air system (combustion and cooling air)
- Starting system (batteries and charger)
- Alternator (a frequently overlooked item)
- Transfer switch (another often-overlooked item)



The coolant thermal-protection level should be checked every six months. The general inspection

At a minimum, a good visual inspection should be done on a monthly basis, as well as after any extended generator run times. Here are some basic tips:

- Maintain general cleanliness of the generator and its surroundings. In an enclosed unit, make sure there are no rodents trying to take up residence.
- Check the oil level when the unit isn't running. If the generator has been running, wait for

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10 minutes after it shuts down to check the oil level (this allows all of the oil in the engine to drain back into the sump). Maintain the oil level as close to the full mark as possible without overfilling.

- Make sure there is adequate coolant by checking the level in the catch tank (overflow tank).
- For diesel units, check the fuel level and the fuel/water separators. Add fuel and drain water from the separators as necessary. For gaseous units, inspect the fuel-supply piping for leaks or obvious damage.
- Confirm that there are no loose clamps or wire connections, and no corrosion or damage to terminals or wiring. Inspect batteries for cleanliness and signs of corrosion. Check the operation of the battery charger.

Semi-annual inspections

In addition to monthly inspections, check the coolant thermal-protection level every six months. Use the appropriate tester for the type of coolant being used. At the same time, inspect the accessory drive belts for correct tension and condition.



Alternators require an annual inspection, as well as occasional testing of winding resistance. Annual maintenance

Annual maintenance begins with changing the engine oil and filter. If you want to extend oil-change intervals, consider an oil-analysis program. This will give you recommendations based on the actual condition of the lubricating oil.

Replace the air filter and fuel filters, as well. If it is a diesel unit that does not use a lot of the fuel

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in its storage tank, consider having the fuel in the tank filtered and checked for additive content.

Two often-overlooked items that require annual inspection—and *possible maintenance*—are the alternator itself and the transfer switch:

- Alternators that are producing good power usually only require a visual inspection. Dirt, heat and moisture are their biggest enemies. Dirt can block the heat transfer necessary to keep the windings cool. Heat can damage the insulation on the windings. Moisture can cause windings to short to each other or to ground. Any of these situations will reduce the power that a winding can produce. Most alternator manufacturers provide recommendations for testing winding resistance and cleaning windings, if necessary.
- Transfer switches can be a little more challenging to inspect and maintain. To do a thorough annual inspection requires turning off all power to the switch. This may involve coordinating a planned outage for a specific time period on a weekend or during the night.

Other generator PM aspects

The above items are by no means a complete list. Other PM aspects worth considering include the conducting of weekly exercise periods under load to test the entire system for proper operation and make the generator work at operating temperature. A monthly load test of at least 30% of rated load is required in some applications, using the building load, a load bank or a combination of the two.



Alternators require an annual inspection, as well as occasional testing of winding resistance. OEMs provide detailed maintenance guidelines that should be followed to provide the longest most reliable service life possible for their respective equipment. General guidelines for specific applications also can be found in several recognized standards. One such standard is the *NFPA 110, Standard for Emergency and Standby Power Systems (2010)*

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Edition). It is an excellent resource on general-maintenance requirements and detailed information on some specific maintenance items. This standard also contains a suggested maintenance schedule which, if followed, will meet minimum maintenance requirements for Level 1 and Level 2 emergency standby power systems. In the meantime, for a handy checklist, refer to the sidebar on page 43. Remember: Establishing and following a thorough maintenance and service plan will provide you with a reliable power supply for many years.

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A Generator Maintenance Checklist

Here's a handy checklist to help guide you as you work to maintain your standby generator(s). Be sure to take note of the frequency recommendations for these maintenance activities.

Weekly Maintenance

- Run the generator (typically no-load, automatic transfer switch exercise cycle).
- Verify that the unit ran and has no alarms or warnings.
- Ensure adequate fuel levels.
- Ensure that the generator is in "Auto" mode, for automatic startup.
- Check that the circuit breaker is closed.
- Make sure there are no fluid leaks.

Monthly Maintenance

- Check engine coolant level.
- Check engine oil level.
- Check the battery charger.

Bi-Annual Maintenance (Schedule maintenance with a certified technician.)

- Inspect the enclosure.
- Check the battery electrolyte level and specific gravity.
- Check battery cables and connections.
- Inspect drive belts.
- Inspect the coolant heater.
- Check coolant lines and connections.

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- Check for oil leaks and inspect lubrication system hoses and connectors.
- Check for fuel leaks and inspect fuel system hoses and connectors.
- Inspect the exhaust system, muffler and exhaust pipe.
- Check and clean air cleaner units.
- Inspect air induction piping and connections.
- Inspect the DC electrical system, control panel and accessories.
- Inspect the AC wiring and accessories.

Annual Maintenance (Schedule maintenance with a certified technician.)

- Change oil and filter.
- Change the fuel filter.
- Change the air filter.
- Clean the crankcase breather.
- Change spark plugs.
- Check coolant concentration.
- Flush the cooling system (as needed).
- Perform load bank testing.
- Fuel testing & reconditioning (diesel-fueled units only).
- Remove water from fuel tank (diesel-fueled units only).

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