Service Tips

WIT Club News – October 1999

GENERATORS

This month's article will feature generator operating tips and maintenance. For the sake of simplicity, and to encompass the largest possible audience, we will specifically single out the Onan generator. Much of this information is available on the Onan RV website, however, most of this material applies to other makes of generators as well.

Genset Operating Tips:

Prestart checks:
The following prestart checks should be done at the first start of the day and every 8 hours of operation after that.

- Check oil level
- Check exhaust system for leaks and improper placement
- Check fuel system for leaks and make sure there is adequate supply
- Check battery terminals for corrosion and battery for good condition

Starting & Stopping Procedures:

- When starting and stopping your generator it is best to start it and shut if off without loads.
- Turn off A/C and other large loads before starting Genset.
- If Genset is diesel-powered, preheat according to operators' manual prior to start attempt (Quiet Diesel units have automatic preheat cycle.)
- Push and hold start switch. (Do not crank for more than 10 seconds & wait at least 30 seconds before trying again.)
- See "Troubleshooting" section of your generator's operations manual if it doesn't start.
- Before stopping, turn off A/C and other heavy loads. Allow set to run for 2 minutes.

Restarting a Stalled Genset:

- Try to determine why it shut down (low oil, fuel, low battery, overload.)
- Disconnect or turn off as many appliances as possible and try restarting the Genset.
- Reconnect appliances one by one to a total load that doesn't overload the Genset.

Resetting Circuit Breakers:

- If a breaker in a vehicle's main power distribution panel or on the Genset trips, there is either a short circuit or too many appliances being operated at the same time.
- Disconnect or turn off as many appliances as possible and reset the circuit breaker.
- If breaker does not trip, reconnect the appliances, one by one, up to a total load that does not overload the Genset or trip the breaker.

Cold/Hot Weather/High Alt. Operation:

- If you travel at high altitudes or in extreme temperatures, be aware the Genset can lose power in lower-density air caused by such conditions. You may not be able to operate as

Genset Troubleshooting

Problem	Possible Causes	Checks/Solutions
Fails To Crank	Low/Dead Battery Bad Connection/Blown Fuse	Check Battery Fluid Level Clean & Tighten Battery
Cranks Slow	Low/Bad Battery, Incorrect Oil Viscosity	Clean/Tighten Cable Connections
Cranks, No Start	Low Oil Level, Carbon Deposits	Add Fuel, Replace Plugs
Black Smoke	Rich Fuel Mix, Dirty Air Filter, Choke Stuck	Replace Air Filter
Unit Runs, Then Stops or Stops When Driving	Low on Fuel, Low Oil Level, Excess Oil	Refill Fuel Tank, Add Oil if Necessary
Unit Starts & Runs, Then Stops When Start Switch is Released	Low Fluid Levels, Possible Overheat	Check Fluid Levels, Possible Blocked Air Flow
Unit Runs Then Surges	Loose/Worn Spark Plug Leads Lean Fuel Mix, Carburetor Icing	Check Leads/Clean/Replace Move Carb Preheater to Winter Position
Circuit Breaker Tops	Overloaded Circuit	Turn Off Some of the Load and Reset the Circuit Breaker

NOTE: If you can't discover and correct the problem, make a note of your Genset model and serial numbers and contact your local certified generator service and parts dealer for assistance.

many electrical devices under these conditions as you would normally.

Altitude: Power output will decrease 3.5% for each 1,000 ft above Onan's base rated altitude of 500 feet.

Temperature: Power output will decrease 1% for each 10-degree F increase in ambient temp above 85 degrees F.

- The generator is not the only appliance affected by hot weather. Your coach A/C units require more power at higher temps. For example, a temp increase from 85 to 110 requires 20-25% more power to run efficiently. This can also limit your ability to run as many electrical devices.
- Make sure the engine oil viscosity is appropriate for the weather. Onan recommends 15W-40 oil. OnaMax is specially formulated for the operating conditions of your generator.
- If you experience problems, set the altitude adjustment know (if equipped.)
- Make sure nothing blocks the air flow, perform maintenance and set summer/winter preheat levels. Winter=temps below 55, Summer=temps above 55.

Genset Exercise, Storage, etc:

- It is important to run your generator to prevent moisture buildup, fuel system damage, and poor performance. If use is infrequent, the Genset should be exercised at least 2 hours every 4 weeks at approximately ½ load. Refer to chart in operator's manual to calculate load. A single two-hour exercise period is better than several short periods.

Genset Maintenance:

Genset maintenance is based on the number of hours running time. If your genset did not come equipped with an hour meter, it is recommended you install one. The following chart shows the recommended maintenance intervals for Onan gensets. This should be used only as a general guideline. Consult your generator's Operator's Manual for procedures and maintenance intervals that pertain to the specific model genset in your motor home.

General Onan Genset Maintenance Intervals

Model Service Item	Service Intervals					
	MTHLY	100 Hrs	150 Hrs	200 Hrs	250 Hrs	500 Hrs
MICROLITE 2800						
Clean & Check Battery & Connection	X					
Clean Spark Arrester			X			
Change Oil		X				
Change Air Filter				X		
Clean Spark Plugs				X		
Change Fuel Filter						X
Schedule Onan Service Center Tune-Up						X
MICROLITE 4000						
Clean & Check Battery & Connection	X					
Clean Spark Arrester			X			
Change Oil			X			
Change Air Filter					X	
Clean Spark Plugs						X
Change Fuel Filter						X
Schedule Onan Service Center Tune-Up						X
EMERALD						
Clean & Check Battery & Connection	X					
Clean Spark Arrester			X			
Change Oil/Oil Filter			X			
Change Air Filter			X			
Clean Spark Plugs			X			
Change Fuel Filter			X			
Schedule Onan Service Center Tune-Up			X			
EMERALD PLUS & MARQUIS						
Clean & Check Battery & Connection	X					
Clean Spark Arrester			X			
Change Oil/Oil Filter			X			
Change Air Filter				X		
Clean Spark Plugs						X
Change Fuel Filter						X
Schedule Onan Service Center Tune-Up						X
DIESEL						
Clean & Check Battery & Connection	X					
Clean Spark Arrester			X			
Change Oil/Oil Filter-All Except Quite Diesel		X				
Change Oil/Oil Filter – Quite Diesel			X			
Change Air Filter						X
Change Fuel Filter					X	
Schedule Onan Service Center Tune-Up						X

NOTE: Maintenance and tune-ups of LP and Diesel fueled gensets can be difficult. We recommend that you depend on the expertise of your local certified Onan Service & Parts Dealer for regular maintenance service on these models.

IMPORTANT: Check your Genset exhaust system each time you start the set. Make sure it doesn't leak and that it extends beyond the vehicle perimeter.

NOTE: Another gasoline or diesel fuel requirement pertains to sufficient fuel level in the tank. With a single fuel tank, it is important not to strand the vehicle without fuel due to generator operation. The generator fuel pickup tube in all Winnebago Industries manufactured motor homes with a factory installed generator or generator prep kit (a vehicle produced ready for generator installation) is limited to the top ¾ of the fuel supply. With ¼ tank capacity remaining, the generator fuel supply will cease and the remaining fuel will be retained for chassis engine operation. Again, we suggest you consult your generator's operator's manual for the specific maintenance instructions and requirements for your particular genset.

Keeping Your Genset Clean & Inspecting for Damage:

Your RV genset is a hardworking device that lives in an unfriendly environment, typically in the underside of your RV. Dust and debris are a part of its daily life. Dust can clog the intake system and reduce its engine's efficiency. Remember to replace air and oil filters regularly to remove dust. Over time, vibration from rough roads can loosen generator parts; and debris thrown up from the road can occasionally damage fuel lines and exhaust systems. It makes good sense to inspect all these items regularly.

Fuel Recommendations:

Gasoline Gensets – Treat the engine of your Onan Genset to a good grade of regular unleaded gasoline and it'll purr in response. Gasohol (gasoline blended with alcohol) can be used if it contains the correct additive mixture percentages:

- Ethanol Blend – Not more than 10% ethanol.
- Methanol Blend – Not more than 5% methanol and must also contact solvents and corrosion inhibitors.

Oil Viscosity:

Use the following chart to select correct viscosity grades for expected ambient temperature range.

OIL VISCOSITY VS. TEMPERATURE

Expected Ambient Temperatures	SAE Viscosity Grade
32°F (0°C) and higher	30
10°F to 100°F (-12°C to 38°C)	15W-40
0°F to 80°F (-18°C to 27°C)	10W-30 10W-40
-20°F to 50°F (-28°C to 10°C)	5W-30

LPG Gensets – Use clean, HD-5 grade liquid propane gas in a mixture of at least 90% propane. Propane fuels other than HD-5 can contact more than 2.5 percent butane which can result in poor fuel vaporization and poor engine starting in outside temperatures below 32°F.

Diesel Gensets – Use ASTM-2-D (No. 2 Diesel) or ASTM 1-D (No. 1 Diesel) fuel with a minimum Cetane number of 45. Number 2 diesel fuel gives the best economy and performance under most operating conditions. Use number 1 diesel fuel when ambient temperatures are below 32°F and during long periods of light engine load. Use low sulfur content fuel having a cloud point of at least 10°F below the lowest expected fuel temperature. Cloud point is the temperature at which wax crystals begin to form in diesel fuel.

Fuel Filters – The fuel filter is an often forgotten part of any engine. Your generator has one too. It removes bits of debris from the fuel to prevent clogging the carburetor jets. Over time the fuel filter collects enough material to become plugged, which restricts fuel flow and reduces the genset's power delivery. So be sure to change the fuel filter on a regular maintenance schedule.

A Word About Oil

Use a premium quality engine oil in the correct oil viscosity for your genset's typical operating temperature range to provide optimum engine service. Avoid mixing different grades or brands.

It's good practice to check the oil level daily, or every 8 hours of operating time. Keep the oil level as near as possible to full but do not overfill. Overfilling may cause foaming and engine shutdown. Replace the cap tightly to avoid leakage. And if your genset has an oil filter, change it when you change the oil.

Do NOT check the oil level while the genset is running because hot oil can be thrown out of the dipstick hole causing severe burns.

Multi-grade oils (such as SAE 15W-40) are recommended for year-round use in Onan liquid-cooled engines, or as a good all-season oil for air-cooled engines. SAE 30 is the preferred summer grade for optimum oil consumption control in Onan air-cooled engines.

Gasoline Engine Oil Quality – Use oils meeting API performance categories SH/CE, SH/CD, SH, SG/CE or SG/CD.

Diesel Engine Oil Quality – Use oils meeting API categories CG-4, CF-4, CE/SG or CD/SG.

Off-Season Storage Tips/ Preventing Fuel Varnishing

If you're storing your RV over the winter, or you don't operate it often enough to refuel the gas tank every month, you should take special care to prevent fuel varnishing from harming your genset engine. Fuel varnish is a gummy residue that forms when fuel gets old and begins to break down. Gasoline can deteriorate in as little as 30 days. It clogs the genset's carburetor, making the genset run poorly even though it may have very low operation hours. Fuel varnishing affects any engine, but it's more noticeable in RV gensets because the engines are smaller. Even a slight decrease in efficiency has a big impact on performance. A genset with varnish build-up may start, but run like it needs a tune up.

Running the genset out of fuel won't prevent varnishing because a small amount of fuel always remains in the genset carburetor. The only way to prevent fuel varnishing in units that aren't used often is to treat the fuel tank with a fuel preservative. OnaFresh Fuel Preservatives and Stabilizer, which is added to all Onan Gensets before they leave the factory, is a fuel preservative specifically developed for gasoline and diesel RV generators. It will prevent varnishing and extend fuel life up to 6 months.

Once varnishing has occurred, a preservative won't correct the problem. You need to add a fuel cleaner, or manually clean the fuel system parts. Onan Premium Fuel System Cleaner can greatly reduce the amount of carbon deposit build-up. It can be used in either of two modes, clean-up or stay-clean mode. If you suspect carbon deposits, use Onan Premium Fuel System Cleaner in the clean-up mode. To prevent carbon deposits from forming, use Onan Premium Fuel Systems Cleaner in the stay-clean mode. Always read and follow label directions.

If you have specific questions regarding the generator in your Winnebago Industries motor home, you may address them to one of the following generator manufacturers:

Onan Corporation
1400 73rd Ave NE
Minneapolis, MN 55432
Ph: 800-888-ONAN
www.onanrv.com

Generac Corporation
P.O. Bo x8
Waukesha, WI 53187
Ph: 800-333-1322
www.generac.com

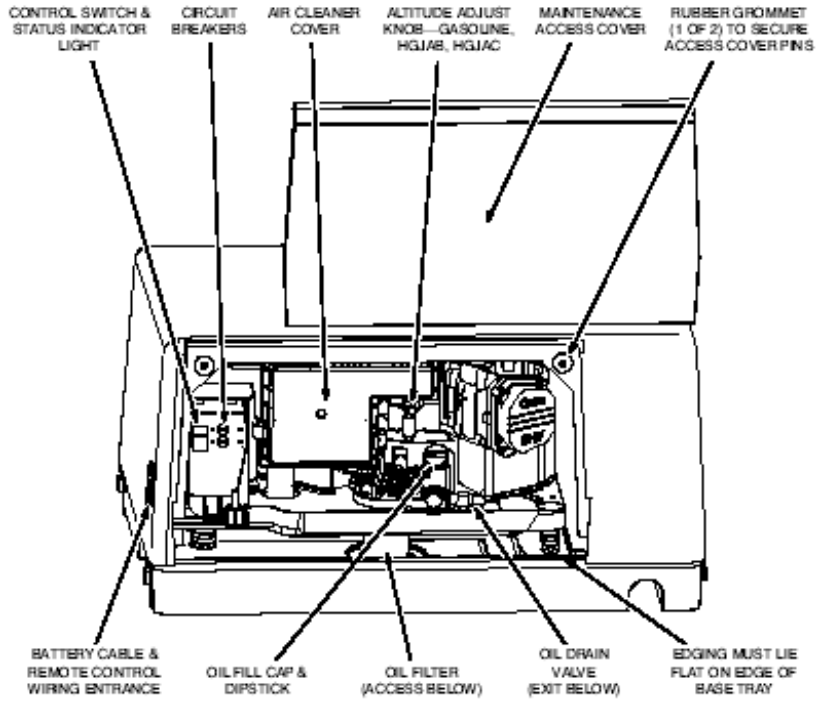
Kohler Company
Generator Division
Kohler, WI 53044
Ph: 800-544-2444
www.kohlergenerators.com

Common Power Requirements

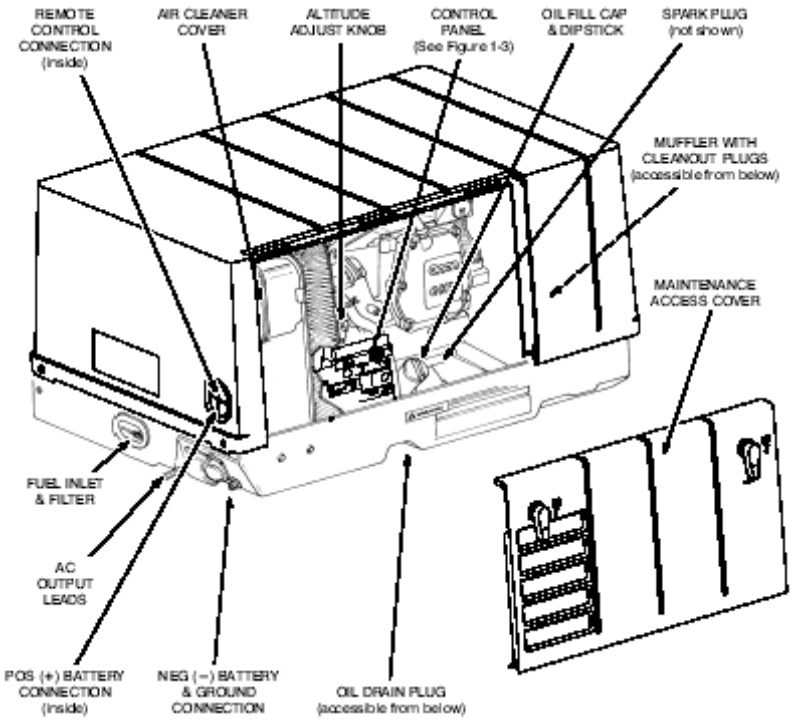
The following is a general guideline for wattage and amperage of commonly used RV appliances. Check the nameplate ratings on the motors and appliances in your RV for exact ratings.

Appliances	Average Required Wattage	Approximate Amps
Air Conditioner	1400 - 2200	12 - 18
Battery Charger	Up to 800	6 - 7
Blender	600	5.5
Broiler	1350	12
Coffee Pot	550 - 700	4 - 6
Compact Disc Player & Speaker	50 - 100	0.5 - 0.9
Computer	50 - 100	0.5 - 0.9
Converter	300 - 350	2 - 3
Curling Iron	20 - 50	0.2 - 0.5
Dishwasher	1400	12
Electric		
Blanket	50 - 200	0.5 - 1.5
Broom/Vacuum	200 - 500	1.5 - 4
Drill	250 - 750	2 - 6
Fan	25 - 100	0.2 - 0.9
Frying Pan/Wok	1000 - 1350	8 - 11
Stove (per element)	350 - 1000	3 - 8
Water Heater	1000 - 1500	8 - 13
Water Pump	500 - 600	4 - 5
Hair Dryer	350 - 1000	3 - 8
Iron	500 - 1200	4 - 10
Light Bulbs (each)	40 - 100	0.36 - 0.9
Microwave	700 - 1500	6 - 13
Radio	50 - 200	0.5 - 1.5
Refrigerator	600 - 1000	5 - 8
Sewing Machine	125	1.0
Space Heater	1000 - 1500	8 - 13
Television	200 - 600	1.5 - 4
Toaster	750 - 1200	6.5 - 10
Washer/Dryer	2000 - 2250	16
VCR	150 - 200	1.15

Marquis



Microlite



Diesel