

\$5.00

# Onan RV GenSet Handbook



Handy facts and tips to help you keep your RV genset running smoothly.

## TABLE OF CONTENTS

Introduction . . . . .	3
Onan 3-Year Limited Warranty . . . . .	4
Air Versus Water Cooling in the RV GenSet . . . . .	6
RV GenSet Operation . . . . .	6
Common Power Requirements . . . . .	7
Preventing Surging . . . . .	10
Do's and Don'ts . . . . .	11
Commonly Asked Questions . . . . .	13
Problem Troubleshooting . . . . .	16
General RV GenSet Maintenance . . . . .	17
Service Point Diagrams . . . . .	18
General Maintenance Intervals . . . . .	21
Maintenance Record . . . . .	22
Off-Season Storage Tips . . . . .	23
Oil Recommendations . . . . .	26
Onan Maintenance Parts and Chemicals . . . . .	27
Onan RV GenSets	
MicroLite . . . . .	32
Marquis . . . . .	34
Emerald . . . . .	36
Diesel . . . . .	38
Repowering or Upgrading . . . . .	40

# Onan

Onan Corporation  
1400 73rd Avenue N.E.  
Minneapolis, Minnesota 55432

Dear Onan GenSet Owner:

As an owner of a recreational vehicle, you need to know the answers to many questions in order to keep all systems running smoothly.

Now when you have questions about your Onan® RV GenSet, you can turn to this handbook for easy-to-understand answers.

This handbook has been developed and written by the same people who have made Onan GenSets the industry standard. People who know exactly what makes a genset tick, and who know just what to do to keep it performing at the level you expect.

We suggest you familiarize yourself with the contents of the handbook, and then keep it in your glove compartment for quick reference.

All of us at Onan are committed to providing you quality products that meet your needs. Just as important, we are committed to serving your needs after the sale. This handbook is one example of that commitment. By following the tips in it, and by having a certified Onan dealer provide service at regular intervals, your GenSet should serve you well for many years to come.

Sincerely,



Richard A. Coon  
Director of Recreational Vehicle Business Group  
Onan Mobile Business Group



## I. INTRODUCTION

This handbook has been prepared as a general guide for overall RV genset operation and maintenance. Keep it handy in your glove compartment for quick reference. And for important safety instructions, specific break-in, operation, storage, troubleshooting and maintenance procedures for your particular genset, refer to your Onan Operator's Manual. (See page 31.)

### Take Convenience and Comfort With You Where Ever You Travel.

It makes no difference whether you're a veteran or novice RVer, the RV experience can be the joy of a lifetime. If this is the first time you've used an RV you'll find the people you meet to be friendly and helpful. If you're a veteran, you already know the great fun you can have RVing.

The Onan RV generator set is designed to help you bring all the comforts of home to your on-the-road travel. It produces the electrical power to operate various items inside and outside your RV. Air conditioners, hair dryers, coffee makers, televisions, microwaves, even power tools can be operated with the electrical power from a genset. Driving through the Arizona desert, climbing Pikes Peak, or just parked quietly at your lakeside lot, with an Onan genset you can still have practically every pleasure and modern convenience you enjoy at home.

### **Onan RV Gensets—The quietest, most popular RV gensets in the world today!**

More than 8 out of 10 RV's equipped with a genset on the road today have an Onan genset. Onan pioneered recreational power generation equipment, building the first set, the "Tent-Lite™", in 1927. Today Onan offers you the widest, most feature packed selection of RV power generators, backed by the industry's most comprehensive user support program.

### **If It Says Onan, It's Quality**

Onan RV gensets carry a reputation for quality and dependable power. And it's no coincidence. All Onan gensets undergo vigorous factory testing to meet strict quality standards. In fact, we put them through the most extensive product testing program in the industry.

### **Onan 3-Year Limited Warranty**

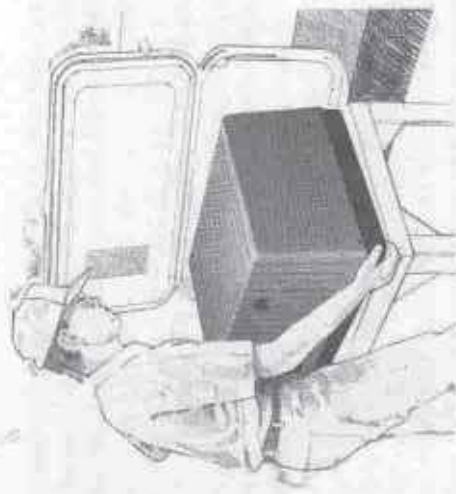
As testimony to our confidence in our products, Onan was first to back our RV gensets with a 3-year limited warranty, the longest most comprehensive warranty in the business. And it's transferable from one owner to another if you decide to sell your RV during the genset warranty period.



The Onan RV genset warranty covers virtually everything that could go wrong during the first two years you own your set. In addition, it covers parts and labor on major power train and generator parts during the third year. And under a special 90-day adjustment policy, if your new Onan genset needs any minor adjustments in the first three months you own it, we'll make them FREE! Ask your Onan Service & Parts Dealer for complete details.

### **Easy to Locate Certified Onan Service & Parts Dealers.**

The last thing you need to worry about when you're on the road is your generator set. That's why Onan has trained, certified and stocked a network of over 1000 authorized Onan service dealers covering all major metropolitan areas in the U.S. and Canada.



So no matter when or where you travel in North America you'll never have to go far for genset service or maintenance care parts. Be it routine care or, however unlikely, emergency service, the local certified Onan Service & Parts Dealer will know your RV genset inside and out, and have the maintenance parts and chemicals you need on hand, in stock. Check the Yellow Pages under "Generators-Electric", or just call 1-800-888-ONAN and ask us to send you a Certified Onan RV Service & Parts Dealer directory (F-919), for a handy listing of dealers wherever you travel.

### **Genuine Onan Maintenance Care Parts & Chemicals**

For your ongoing satisfaction and the dependability of your Onan genset, Onan offers a complete line of replacement and tune-up parts, oil and maintenance chemicals specifically designed for RV gensets.

Easy to find at certified Onan Service & Parts Dealers coast to coast, Onan Green Label™ RV parts are packaged for correct selection and convenient on-board storage. (See page 27 for a catalog listing of the complete Onan Maintenance Care product line.)

### **There's an Onan Genset Model to Fit Your RV Need**

An RV generator set is the combination of a gasoline, diesel or LP liquid or vapor powered engine and an electrical generator. It is a totally independent power source that is separate from the main engine of your RV. Besides providing power for appliances, it can help you economize by allowing you to run equipment such as air conditioners and heaters separate from the main RV engine while driving.

There is a choice of Onan RV genset model options to meet the power needs of even the most unique RV travel experiences. (See page 32 for a catalog listing of the Onan RV genset lines.)

### Air Versus Water Cooling in the RV Genset

Modern automobile industry has been revolutionized by the water cooled engine. Some generator manufacturers have elected to transfer this technology to the RV genset. Onan manufactures both air and water-cooled engines for a variety of applications. After undergoing an extensive evaluation process, we determined that air-cooled gasoline gensets are better suited to RV applications. The simpler design makes air-cooled gensets more reliable. Since they have no water pumps, hoses and other extra parts associated with water cooling, air-cooled gensets are also easier for end users to maintain properly. Plus, air-cooled gensets are easier and less costly for dealers to repair and service.

## II. RV GENSET OPERATION

### Determining the Capacity of Your Genset

Can you operate all electrical items in your coach at once? Probably not. If you try to operate too many appliances at one time you'll "overload" the genset. You'll know because the lights will flicker or the circuit breakers on the genset or in the main coach electrical panel will trip open, stopping the flow of power.

**NOTE:** The genset will continue to run after a circuit breaker trips. Turn off all appliances and reset the breaker. If the breaker trips again with all electrical loads off, you may have a short circuit in your wiring. Turn off the genset and contact a qualified electrician.



To determine the amount of genset power you can operate simultaneously in your RV, add up the watts of all your appliances, toasters, lamps, air conditioners etc. (All electrical appliances and lights are labeled with their power requirements expressed in watts or amps. See chart below.) You can then use any number of appliances at the same time as long as their combined wattage doesn't exceed the electrical output of your Onan generator, or your coach's circuit breaker rating.

**Example—**A Emerald Plus™ 4000 (BGE) should typically run: One 13,500 BTU air conditioner (2200 watts), coffee pot (600 watts), radio (100 watts), converter (300 watts), four lights (400 watts), with 400 watts of power to spare.

### 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	Required Wattage	Approximate Amps
Air Conditioner	1400 - 2200	12 - 18
Battery Charger	Up to 600	6 - 7
Blender	600	5.5
Broiler	1350	12
Coffee pot	550 - 700	4 - 6
Compact Disc Player & Speaker	50 - 100	.05 - 0.9
Computer	50 - 100	0.5 - 0.9
Converter	300 - 250	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 - 9
Wage Heater	1000 - 1500	8 - 13
Water Pump	500 - 600	4 - 5
Hair Dryer	500 - 1000	3 - 8
Iron	500 - 1200	4 - 10
Light Bulbs	40 - 100 each	0.36 - 0.9
Microwave	700 - 1500	6 - 13
Radio	50 - 200	0.5 - 1.5
Refrigerator	600 - 1000	5 - 8
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 - 1.5

## Appliances With Motors

Appliances with motors consume more power during start-up than they do running, sometimes up to 3 times as much power. To use an appliance with a motor, plan on turning it on and warming it up to normal running speed before starting other appliances.

### CAUTION:

Electronic appliances (TVs, Computers, VCRs, etc.) used in your RV may be damaged by power surges unless protected by surge protection devices available at electronic stores. Onan is not responsible for damage to electronic equipment.

## Effects of Environmental, Altitude and Temperature Conditions

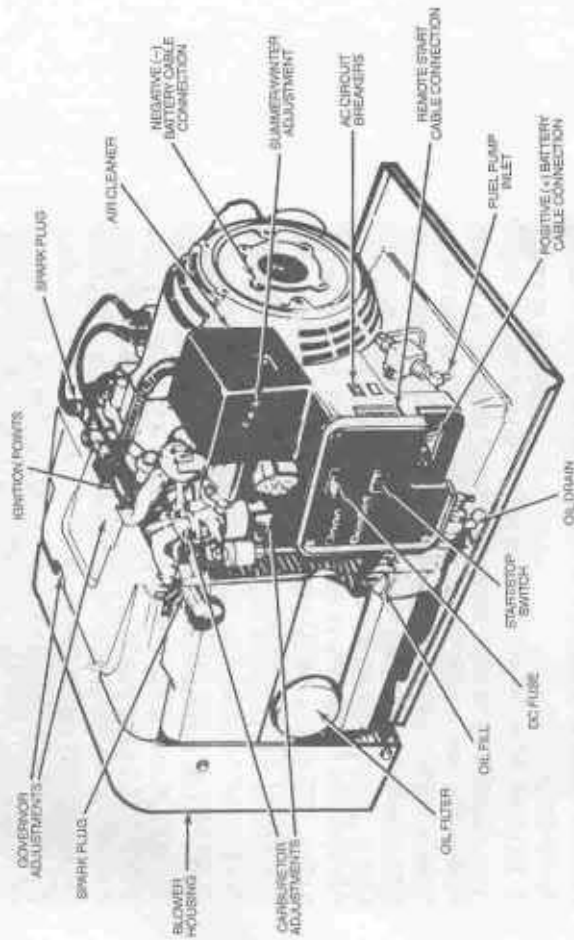
Your RV genset is a hardworking device that lives in an unfriendly environment, typically in the underside of your RV. Dust and debris are a part of its daily life. Dust can clog the intake system of your genset and reduce its engine's efficiency. Regular replacement of the air and oil filters to remove dust is extremely important. (See your operator manual or the Maintenance Interval Chart on page 21.) In addition, vibration from rough roads over time can loosen generator parts, and debris thrown up from the road can damage fuel lines and exhaust systems. It makes good sense to inspect all these items on a regular basis.

Your genset can lose power in lower density air caused by high altitudes and/or extreme temperatures. This means you will not be able to operate as many electrical devices as you could under normal operating conditions.

Maximum power decreases about 3.5% for each 1000 feet above Onan's rated altitude of 500 feet. For example, to operate at 4500 feet (4000 feet above rated genset altitude) multiply  $3.5\% \times 4$  (4000 ft) = 14% power loss. Then multiply .14 x your genset's power rating. Example, 4000 watts x .14 = A Loss of 560 watts at that altitude.

NOTE: The carburetor on a gasoline genset may require adjustment at high altitudes. (See your operator manual or local certified Onan Service Dealer.)

## Location of Basic Genset Components



## Starting & Stopping Procedures

For simple steps for starting and stopping your Onan genset, see your Onan operator manual.

## RV Genset Exercise

It may seem strange that "not" using a machine could cause performance problems, but with RV gensets that's exactly the case.

RV genset exercise is important both in terms of moisture and fuel system damage. Often RV gensets are used infrequently and over time, in as little as 30 days, the gasoline housed in a genset can break down into gums and varnishes. Gum and varnish can clog the fuel system, causing fuel pump, fuel line and carburetor plugging, resulting in hard starting and surging, (never settling on a stable operating speed).

To prevent this, Onan recommends you run your generator at approximately 50% of its capacity (2000 watts, or one air conditioner for a 4000 watt set) for two hours at least once every four weeks. A long two hour exercise period is preferable to several short periods. (See Off-Season Storage Tips, page 23.)

## PREVENTING SURGING

The electrical supply (voltage and frequency) for any appliance must be kept within very close limits. Anyone who has ever watched a TV or computer screen wiggle and shrink has seen the results of changes in an electrical supply. RV gensets are equipped with a speed control system known as a governor. On most RV gensets, this is a mechanical system, although the latest Onan Marquis™ gensets use an electronic governor to control engine speed.

Without a governor, as appliances are turned on, engine speed would simply drop until the genset finally dies. With a governor, the carburetor throttle is opened to compensate for load and a relatively constant speed is maintained. A very carefully designed balance exists between the governor and other genset systems to maintain a stable engine speed. When this balance is upset, the result can be unstable engine speed, or "surging", as the governor tries to stabilize.

## What is wrong?

Because the governor system is a balance of many systems within the genset—engine, fuel system, regulator, and generator—a variety of causes can result in surging. (See Problem Troubleshooting page 16.)

## What can you do?

1. Be sure you have an adequate fuel supply for the genset. Fuel is drawn from a remote fuel tank, and with gasoline fueled RV's its usually the same tank for both the vehicle and the genset. Typically the fuel pickup for the generator extends only ¼ of the way to the bottom of the tank (to keep you from being stranded at your campsite!) So some fuel in the tank may not guarantee the genset is getting fuel. (Note: if you have two fuel tanks in your vehicle make sure both tanks are full.) An inadequate fuel supply can also be caused by cracked/leaking fuel lines or a defective fuel pump. Contact your local certified Onan Service & Parts Dealer to have this checked out.

2. Be sure that you follow the genset exercise recommendations or the out-of-service protection recommendations outlined in the operators manual for your genset. Gum and varnish from stale fuel can plug small carburetor passages causing a lean fuel mixture and surging. Treat the fuel system with Onan Premium Fuel System Cleaner in the clean-up mode ratios, (see page 30.) Contact your local certified Onan Service & Parts Dealer to have the carburetor cleaned and adjusted if the problem persists.

3. Be sure that carburetor, choke, and governor adjustments are performed by your local certified Onan Service & Parts Dealer. These adjustments can only be properly made using specialized instruments.

4. Be sure that the ignition system components are in good condition.

5. Be sure that the carburetor air pre-heater is in the proper position for temperature and humidity at your location. The selector should be in the winter position if the temperature is below 50 degrees F. and/or the humidity is high.

## DO'S AND DON'TS

Operating your Onan RV genset is easy. But before you turn it on there are a few do's and don'ts you should be aware of:

### The Do's

1. DO keep your genset clean by wiping it periodically with a clean cloth.

2. DO turn off all appliances in cold weather before starting your genset, for best long-term performance.

3. DO check the exhaust system periodically for damage or leaks. Make sure the exhaust pipe extends out at least one inch beyond the vehicle perimeter.

4. DO check the carburetor pre-heating selector (for other than Onan Microlite™ 4000 gensets) to be sure it's in the proper position for the surrounding climate and altitude. (See your operator manual for proper settings.)

5. DO check the air filter periodically and clean it by tapping it on a flat surface. Never wash it in solvents or blow it out with an air hose!

6. DO have a running time meter installed for convenience in determining maintenance service frequency.

7. Do operate the genset (exercise it) on a regular basis.

**WARNING:** Exhaust gas is deadly. All exhaust system connections must be checked regularly for any leaks and tightened as necessary. Do NOT operate the genset with a faulty exhaust system. If your RV bottoms out on a driveway or road object, inspect the genset exhaust system for damage. The tail pipe must terminate past the edge of the vehicle.