

SERVICE MANUAL



R V M P[®] F L E X P O W E R[®]

4000i & 5500i INSTALLED GENERATORS



Authorized for installation **ONLY** in Recreational Vehicles prepped by the RV Manufacturer with fuel lines and a compartment for permanent generator installs. Do **NOT** install in any other application without consulting a qualified professional.



**Read this manual carefully before operation.
This manual includes important guidance for safety operation.**

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RVMP® Flex Power® Generators

Troubleshoot and Service Manual

Introduction

This is the troubleshoot and service manual for FLEX POWER generator models 4000i and 5500i. While these models share many similarities, note several sections of this manual where the technical differences between the models are explained in detail.

Safety Precautions

Read and understand all instructions before installing or operating on this product. Adhere to all safety labels. This manual provides general instructions. Many variables can change the circumstances of the instructions, i.e., the degree of difficulty, existing equipment, operation and ability of the individual performing the instructions. Failure to correctly follow the provided instructions may result in death, serious personal injury, severe product and/or property damage and may void portions of the warranty (See Owner’s Manual for warranty info). We recommend that installation and servicing is performed by a qualified and experienced RV technician.

This manual cannot provide instructions for every possible scenario, but provides the general instructions, as necessary, for troubleshooting and servicing the generator in most situations. If you have any questions, please contact us at:

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⚠ FIRE SAFETY NOTICE

Keep multi-class ABC fire extinguishers handy. Class A fires involve ordinary combustible materials such as wood and cloth. Class B fires involve combustible and flammable liquid fuels and gaseous fuels. Class C fires involve live electrical equipment.

⚠ WARNING

The “WARNING” symbol above is a sign that a procedure has a safety risk involved and may cause death or serious personal injury if not performed safely and within the parameters set forth in this manual.

- **Failure to follow instructions provided in this manual may result in death, serious personal injury and/or severe product and property damage, including voiding all or portions of the warranty.**

- Do not operate equipment when mentally or physically fatigued or after consuming alcohol or drugs.
- Do not use starting fluids which can cause an explosion and may result in death, serious personal injury and/or severe product and property damage. Do not use evaporative starting fluids. They are highly explosive.
- Installing or maintaining a generator can cause severe personal injury. Wear personal protective equipment including safety glasses, hard hats, steel-toed shoes and protective clothing when working on equipment.
- Benzene, found in some fuels, and used engine oils have been identified by some state and federal authorities to cause cancer or reproductive toxicity. Do not ingest, breathe fumes or come into contact with gas or oil when checking, draining or adding gas and oil.
- Hot, moving and electrically-live parts can result in death, serious personal injury and/or severe product and property damage. Only trained and experienced personnel should make adjustments while the generator is running. Otherwise, adjustments should be made only when the generator is not running.
- Moving parts can catch on loose clothing items or jewelry. Do not wear loose clothing or jewelry near moving parts including shafts, fans, belts and pulleys.
- Moving parts can seriously injure body appendages, including fingers. Keep hands away from moving parts. Keep protective guards in place over fans, belts, pulleys and other moving parts.
- Improperly installed electrical connections may result in death, serious personal injury and/ or severe product and property damage. Electrical connections must be made by trained and experienced electricians in accordance with applicable codes.
- Back-feeding to shore power may result in death, serious personal injury and/or severe product and property damage. The generator must not be connected to shorepower or any other source of electrical power. An approved switching device must be used to prevent interconnections and serious damage to the generator.
- Operating, servicing and maintaining and maintaining this equipment can expose you to chemicals, including engine exhaust, carbon monoxide, phthalates and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, do not idle the engine except as necessary, service your equipment in a well-ventilated area and wear gloves or wash your hands.
- Do not install the generator on a watercraft or boat. Such an installation might violate U.S. Coast Guard regulations and may lead to damage, fire, injury, or death.

⚠ CAUTION

The "CAUTION" symbol above is a sign that a procedure has a safety risk involved and may cause personal injury, product or property damage if not performed safely and within parameters set forth in this manual.

- **Always wear eye protection when performing service, maintenance or installation procedures. Other safety equipment to consider would be hearing protection, gloves and possibly a full face shield, depending on the nature of the task.**

Troubleshoot Issue #1: Generator tries to start, some lights illuminate on the control panel, but generator will not start.

Check battery

Check the battery for at least 12–13V DC. Use a multimeter to determine the battery voltage by applying the probes to the positive and negative terminals on either the battery itself or the terminals on the side of the generator which accept the positive and negative battery cables.

Check the battery for at least 450 CCA. For lead acid batteries, use a battery tester to measure the cold cranking amps (CCA) of the battery and ensure at least 450 CCA. For lithium batteries, ensure that the battery has a state of charge (SOC) of at least 25%.

Check oil level

The generator is equipped with an oil level sensor that prevents the generator from starting when the oil level is too low. There is a Low Oil light on the front control panel that will illuminate when the sensor measures an oil level that is below the threshold for starting. Generally speaking, the generator oil capacity must be almost completely filled in order for this switch to actuate and allow the generator to start. The sensor for the oil level is very sensitive and so even having slightly too little oil will prevent the generator from starting.

If the Low Oil light is illuminating, this indicates that the low oil float is sending spark energy to the light.

If the Low Oil light is not illuminating, it is possible the spark circuit is not producing adequate power. Check the spark circuit for adequate power.

If the Low Oil light is illuminated but the generator is full of oil, there could be an issue with the float switch in the oil sensor. Try unplugging the oil sensor and see if the generator starts. You can unplug the wire harness for the oil sensor in order to temporarily disconnect this sensor, but make certain that the generator is full of oil before trying this and NEVER operate the generator without having the oil sensor plugged in and operating, this is only for a quick test. If the generator starts, then there is likely a problem with the float in the sensor and it may need replaced. If it doesn't start, proceed to check the other problems.

If the oil reservoir is full but you know there is not enough oil in the unit, there is likely an air bubble inside the oil pan and/or crank case. To remove the bubble, pull the manual start or try to start the unit from the start button (it may take several pulls or attempts to start in order to completely remove the air).

Check spark plug circuit for adequate spark

Remove spark plug boot and unscrew spark plug from the engine with a spark plug socket. Re-attach the spark plug boot and carefully observe the spark plug gap while trying to start the generator. Be sure to stay clear of the spark plug gap and only observe for a spark with the naked eye. Depending on the amount of ambient light, the spark may not be observable and this does not necessarily mean there is a bad spark plug.

If a spark cannot be observed with the naked eye, use an inline spark tester to determine if there is adequate spark from the spark circuit. Place the in-line tester in between the boot and the spark plug and attempt to start the generator. When using an inline tester it should be easy to determine the amount of light being generated by the tester and this indicates the strength of the spark circuit burst.

If the inline spark tester indicates only a small amount of light when attempting to start the generator, re-check the voltage on the battery and make sure that it's not too low. Also check the ignition coil for proper resistance as described above.

If the inline spark tester indicates a proper amount of light when attempting to start the generator, then the spark plug circuit for the generator is working properly.

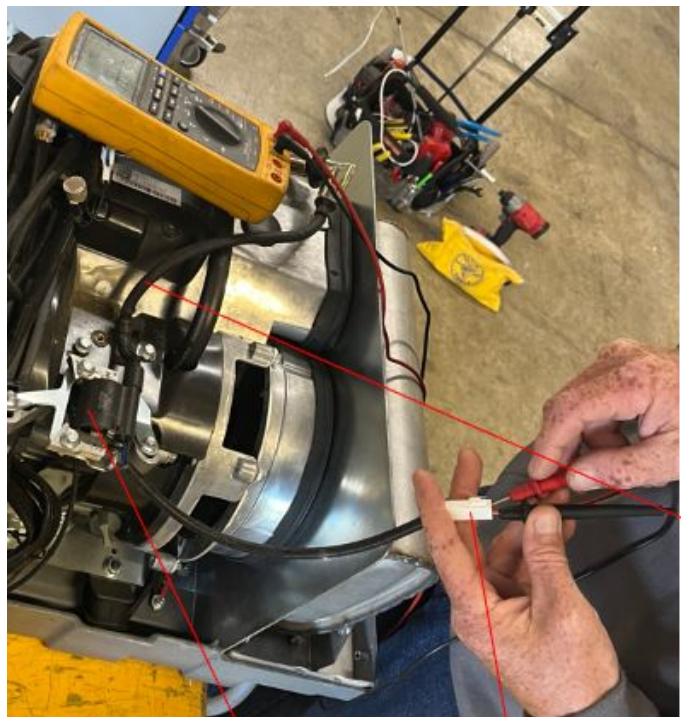
If there is no light observed within the inline spark tester, then there is a problem with the spark circuit, likely the ignition coil.



Ignition coil

To check an ignition coil for proper function, check the following two resistances with a digital multimeter placed on the resistance setting (Ω):

1. Main ignition coil harness. Place one multimeter probe on the first conductor inside the harness and the other multimeter probe on the second conductor and measure this resistance. This measurement should be around 1–2 ohms. If the resistance is infinite, there is an open circuit failure and the ignition coil needs to be replaced.



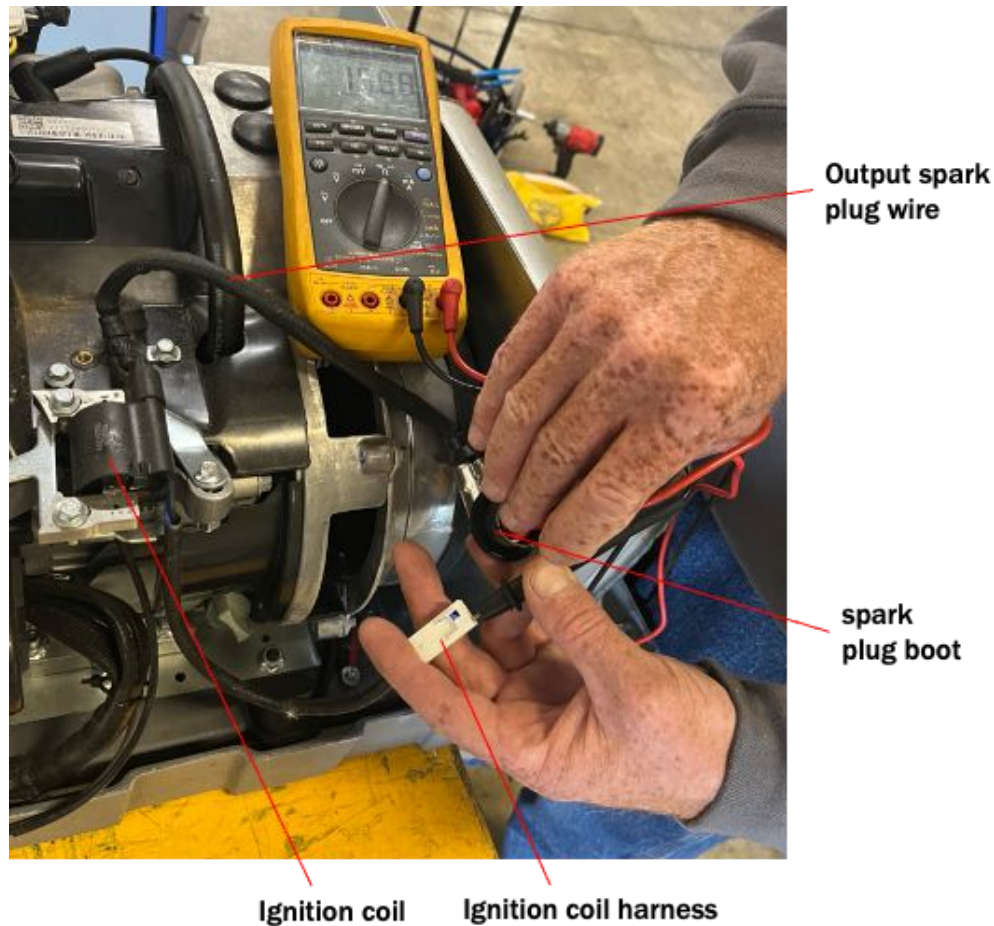
Output spark
plug wire

Ignition coil

Ignition coil harness



2. Output spark plug wire. Place one multimeter probe on the first conductor inside the harness and the other multimeter probe on the interior conductor of the spark plug boot. This measurement should be around 15,000 ohms. If the resistance is infinite, there is an open circuit failure and the ignition coil needs to be replaced.



Check spark plug for damage

If the generator is new, it's very unlikely that the spark plug would be bad and therefore prevent the generator from starting. However, in some situations even a new spark plug could be fouled by too much fuel during the initial startup, perhaps by holding the Prime button down for too long before attempting to start the generator. If this happens you should smell fuel, but perhaps not in all cases. To overcome this situation, simply allow the fuel to dry off the spark plug and then attempt to restart after about ten minutes.

If the generator has been used previously, it's possible that the spark plug has gone bad, especially if the generator was used in less than ideal conditions. For example, if the air filter is clogged the balance of fuel to air in the carburetor will not be in balance and fuel deposits will be left on the spark plug.

- Normal Wear: The electrode and insulator should have a tan or light brown color, indicating the plug is functioning well.
 - Fouling: Look for deposits like oil, fuel, or carbon buildup on the electrode. Fouling can hinder the spark plug's performance.
 - Wear and Tear: Examine for any cracks, chips, or other visible damage.
 - Serious Corrosion: Examine the threads of the spark plug and the electrode for corrosion. Replace the spark plug if there are noticeable signs of fouling, wear and tear, or corrosion.
- Proper spark plug gap: **0.024 in – 0.0315 in (0.60 mm – 0.80 mm)**

Check proper function of fuel module, ECM, and inverter on 4000i

Electrical Harnesses

The 4000i requires electrical communication between the various components such as the fuel module, ECM, and the inverter in order to start and run properly. In some instances, it's possible that one of the electrical harnesses came unplugged through vibration or snagging when the cover was attached/replaced. If the generator is not starting or running properly be sure to check all wire harnesses.

Fuel module

During normal operations, when the start button is pressed there should be audible indications from the fuel pump or fuel solenoid of proper starting operations. When the fuel selection switch is on gas, you should hear the fuel pump running as part of the startup sequence. When the fuel selection switch is on LP, you should hear the gas solenoid module click. If you hear nothing when the start button is pressed, check the 10 Amp fuse to the fuel module (located near the front control panel) as this may be blown and if so this is preventing the fuel module from getting power and operating the fuel pump/fuel solenoid properly.

Engine Control Module (ECM)

The 4000i model does not use a traditional starter, but instead uses the windings inside the stator/rotor of the generator to create a spark. When pressing the start button, if you can hear the fuel pump running or the fuel solenoid 'click' but there is no spin or attempt to spin the rotor in the generator then it's possible that the ECM could be bad. To test for this, try using the manual pull start to start the generator. If the generator starts with the pull start but will not start with the start button, then the ECM is likely bad. Replace the ECM to confirm.

Inverter

Generally speaking, if the inverter had a failure the unit should still be able to start and run (although rough). So if a 4000i generator is failing to start it's not likely due to a bad inverter.

No reaction from throttle motor

However, if there is NO reaction from the throttle motor once the generator starts, it is possible that the inverter could be bad because during proper operation the inverter supplies the throttle motor with instructions on when to increase/decrease the throttle due to electrical load(s) on the generator. Thus, during proper operations, the throttle motor should be making adjustments during idle and also once an electrical load is applied. If the inverter fails to send proper instructions to the throttle motor, the RPM of the motor would stay constant regardless of whether there is any type of electrical load on the generator or not. If this scenario is present, try swapping out the throttle motor for a motor that is known to be working. If the throttle motor still does not move with a working replacement, then it's likely that the inverter is bad and needs replaced.

No 120V output

Additionally, there could be a failure in the inverter if the generator starts but there is no 120V output. You can observe this failure by looking at the digital display on the front of the unit once the generator starts and pressing the option button on the display until the output voltage is displayed. If zero volts is indicated on the display for the output

power then it's likely the inverter is bad. This can also be checked by placing a multimeter on the two 120V AC output wires and see if there is proper voltage output. If not, the inverter is likely bad.

Inverter cooling fan does not spin

Additionally, there could be a failure in the inverter if the fan on the side of the inverter does not spin once the generator starts. This fan gets 120V power from the inverter so if this fan is not spinning, there is likely a failure in the inverter.

Green READY light never comes on

Additionally, there could be a failure in the inverter if the generator starts but the green READY light will not come on. In this situation the OVERLOAD light will remain on but the green READY never illuminates and this is likely the sign of a failure in the inverter.

Check proper function of fuel module, starter, and inverter on 5500i

Electrical Harnesses

The 5500i requires electrical communication between the various components such as the fuel module, starter, and the inverter in order to start and run properly. In some instances, it's possible that one of the electrical harnesses came unplugged through vibration or snagging when the cover was attached/replaced. If the generator is not starting or running properly be sure to check all wire harnesses.

Fuel module

During normal operations, when the start button is pressed there should be audible indications from the fuel pump or fuel solenoid of proper starting operations. When the fuel selection switch is on gas, you should hear the fuel pump running as part of the startup sequence. When the fuel selection switch is on LP, you should hear the gas solenoid module click. If you hear nothing when the start button is pressed, check the 10 Amp fuse to the fuel module (located near the front control panel) as this may be blown and if so this is preventing the fuel module from getting power and operating the fuel pump/fuel solenoid properly.

Starter

The 5500i uses a starter to generate the electrical energy for the spark. If the generator is not starting with the START button, try using the manual pull cord start. If the generator starts with the pull cord but not with the START button, then the starter could have a failure.

Check for a failure in the starter by performing a resistance winding test using the digital multimeter placed on the resistance setting (Ω). Place the positive probe of the meter on the positive supply and negative probe of the meter on the housing and read the resistance measured by the multimeter. The resistance should be zero or very very low. The resistance should not be infinity (completely open). If this resistance is over 0.1 ohms then there is likely a direct short in the starter and it needs to be replaced.

Inverter

Pull start test

The 5500i uses the inverter to control the start sequence, so if the generator will not start it could be a bad inverter. To test for this, attempt to start the generator using the manual pull cord and listen for the fuel pump or the fuel solenoid 'click.' If the fuel pump does not run (when on gasoline) and the solenoid does not click (when on LP) then it's possible the inverter is bad.

No reaction from throttle motor

If there is NO reaction from the throttle motor once the generator starts, it is possible that the inverter could be bad because during proper operation the inverter supplies the throttle motor with instructions on when to increase/decrease the throttle due to electrical load(s) on the generator. Thus, during proper operations, the throttle motor should be making adjustments during idle and also once an electrical load is applied. If the inverter fails to send proper instructions to the throttle motor, the RPM of the motor would stay constant regardless of whether there is any type of electrical load on the generator or not. If this scenario is present, try swapping out the throttle motor for a motor that is known to be working. If the throttle motor still does not move with a working replacement, then it's likely that the inverter is bad and needs replaced.

No 120V output

Additionally, there could be a failure in the inverter if the generator starts but there is no 120V output. You can observe this failure by looking at the digital display on the front of the unit once the generator starts and pressing the option button on the display until the output voltage is displayed. If zero volts is indicated on the display for the output power then it's likely the inverter is bad. This can also be checked by placing a multimeter on the two 120V AC output wires and see if there is proper voltage output. If not, the inverter is likely bad.

Inverter cooling fan does not spin

Additionally, there could be a failure in the inverter if the fan on the side of the inverter does not spin once the generator starts. This fan gets 120V power from the inverter so if this fan is not spinning, there is likely a failure in the inverter.

Green READY light never comes on

Additionally, there could be a failure in the inverter if the generator starts but the green READY light will not come on. In this situation the OVERLOAD light will remain on but the green READY never illuminates and this is likely the sign of a failure in the inverter.

Check for restrictions to gasoline line

If the generator will not start, check the gasoline lines from the tank to the generator to ensure that there are no kinks or bends. Also check to make sure that a clip or zip tie has not closed off the flow of gasoline through the fuel line or constricted it in any way. If the fuel line is being restricted you should hear the fuel pump begin to get louder once there is no fuel or a small amount of fuel within the pump. If you hold down on the prime button and the fuel pump gets

louder and/or makes a ‘clicking’ sound, there is either no fuel or a small amount of fuel getting into the fuel pump, and therefore some type of restriction in the gasoline line.

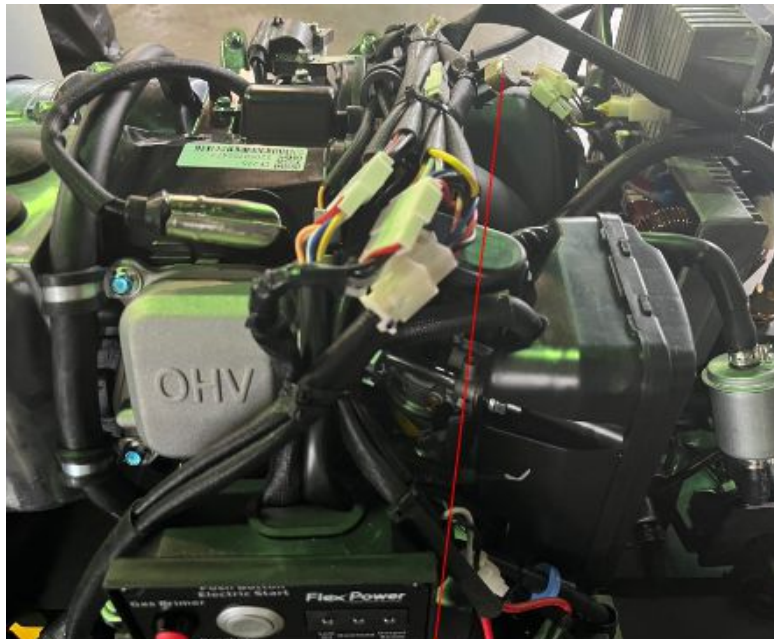
Check for vacuum lock in the gasoline line

If the generator will not start, check the gasoline lines for possible vapor lock. When drawing gasoline from a tank that contains a separate fuel pump for the RV chassis engine or a fueling station, this can create a vapor lock in the gasoline line that will prevent the fuel pump of the generator from overcoming the vacuum and drawing fuel into the generator. If this occurs, you should hear the fuel pump begin to get louder once there is no fuel or a small amount of fuel within the pump. If you hold down on the prime button and the fuel pump gets louder and/or makes a ‘clicking’ sound, there is either no fuel or a small amount of fuel getting into the fuel pump, and there could be a vapor lock preventing fuel from getting to the generator.

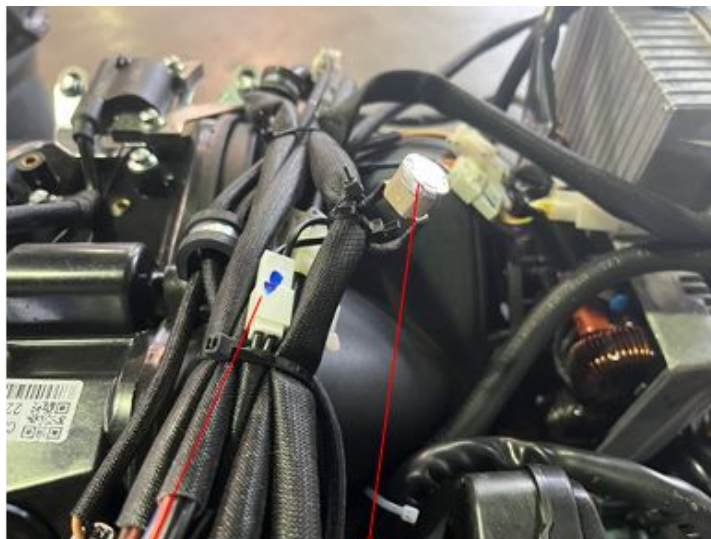
In these situations, the gas cap on the gasoline tank can be loosened to allow the vacuum to release. However, DO NOT leave the gas cap loosened as gas may be able to spill out of the tank when the RV is moving. If you are consistently experiencing vapor lock, explore a vented gas cap for the tank that will allow air into the tank and remove the vacuum.

Check housing temperature sensor disc

If the generator will not start, check the temperature disc at the top of the generator for a possible failure or not being plugged in. After removing the housing there is a bundle of wire harnesses at the center of the generator and the top of this bundle contains a housing shaped like a disc that contains a thermocouple for measuring the temperature within the housing.



**Internal housing
Temperature disc**



**Wire harness for
Temperature disc**

**Internal housing
Temperature disc**

In some instances, this temperature sensor can fail, especially when exposed to very high ambient temperatures for a long period of time. Try unplugging the wire harness for the temperature sensor and see if the generator will start. If so, there is a failure in this temperature sensor and it needs to be replaced. DO NOT operate the generator without this temperature sensor or there will be no thermal protection for the generator if temperatures rise above the operational parameters and into a high temp damaging scenario which could damage various components of the generator permanently.

Check gasoline solenoid on carburetor

If the generator will not start on gasoline, it is possible that the fuel solenoid on the carburetor is stuck and will not open to allow fuel into the carburetor. Try starting the generator on LP and if it starts with LP then there could be an issue with some restriction in the fuel line, vapor lock, or the solenoid on the carb could be stuck. Check for proper fuel at the carburetor by loosening the screw at the carburetor bowl and holding down the prime button. Fuel should be coming out of the bowl. If not, there could be some restriction in the fuel line, vapor lock, or the solenoid on the carb could be stuck.

To test for a stuck solenoid on the carb, hold down the prime button and listen for two important items: 1) fuel pump running and 2) a 'click' from the carburetor when the solenoid opens. If you do not hear the 'click' then it's possible that the solenoid is stuck and not opening. This can be caused from sitting for long periods of time, especially in a highly corrosive environment, where a buildup of corrosion prevents the solenoid from operating properly. To fix this, hold down the prime button while tapping lightly on the carb with a screwdriver to free the solenoid.

Check alternate fuel source

If the generator will not start on one fuel source, it can often be helpful to try the alternate fuel source in order to rule out any issues with the ignition coil, ECM, or other electrical components involved in the starting process. For example, if the generator will not start on gasoline, try switching the fuel selector switch over to LP and connecting an LP tank (if not already connected) and starting the generator on LP. If the generator starts on LP but will not start on gasoline, we know that there is no issue with the spark plug, ignition coil, ECM, or other common starting components

and that the issue must be within the specific gasoline supply components like the fuel pump, fuel tank, or fuel supply lines. Similarly, if the generator starts with gasoline but will not start with LP, then we know the issue likely has to do with the specific LP supply components like the regulator, gas solenoid, or LP supply.

Check fuel pump

If the generator will not start on gasoline, check to ensure that gasoline is reaching the carburetor. This can be done by loosening the screw on the carburetor bowl and holding down the PRIME button on the control panel. When functioning properly there should be fuel coming out of the bowl. If not, listen to see if you can hear the fuel pump running when you hold down on the PRIME button. If you do not hear the fuel pump running, there could be a failure in the fuel pump and this may need to be replaced. Also if you do not hear the fuel pump running when you hold down the PRIME button, ensure that the fuel selection switch is on gasoline, as the fuel pump will not run when the fuel selection switch is positioned on LP.

Check fuel selection switch

If the generator will not start on gasoline, check to ensure that the fuel selection switch is all the way UP to select gasoline. Ensure that the switch is all the way up. You can hear a 'click' when the switch moves back and forth from LP to gasoline. Similarly, if the generator will not start on LP, check to ensure that the fuel selection switch is all the way DOWN to select LP. Ensure that the switch is all the way down.

Troubleshoot Issue #2:Generator starts sometimes, but will not start other times (intermittent starting).

Check battery

Check the battery for at least 12–13V DC. Use a multimeter to determine the battery voltage by applying the probes to the positive and negative terminals on either the battery itself or the terminals on the side of the generator which accept the positive and negative battery cables.

Check the battery for at least 450 CCA. For lead acid batteries, use a battery tester to measure the cold cranking amps (CCA) of the battery and ensure at least 450 CCA. For lithium batteries, ensure that the battery has a state of charge (SOC) of at least 25%.

Check oil level

The generator is equipped with an oil level sensor that prevents the generator from starting when the oil level is too low. There is a Low Oil light on the front control panel that will illuminate when the sensor measures an oil level that is below the threshold for starting. Generally speaking, the generator oil capacity must be almost completely filled in order for this switch to actuate and allow the generator to start. The sensor for the oil level is very sensitive and so even having slightly too little oil will prevent the generator from starting.

Due to the sensitive nature of the oil level sensor, when the RV is parked on uneven ground the oil in the pan can shift causing a low oil error which prevents the generator from starting. This can cause intermittent starting because the generator will run fine when on level ground but will not start when the RV is on an incline. To remedy this situation, simply add some oil to the generator to ensure the dipstick is showing full even when the RV is parked on an incline.

Similarly, if you are operating the generator while the RV is moving it is possible then when the RV goes up/down an incline or stops quickly, the oil in the pan can shift causing a low oil error which will stop the generator (if running) or prevent the generator from starting. To remedy this situation, simply add some oil to the generator to ensure the dipstick is showing full even when the RV is traveling up/down an incline or stopping suddenly.

Check electrical grounds

It is possible that a loose electrical ground or bad electrical ground can allow the generator to start in some situations but will not start in others.

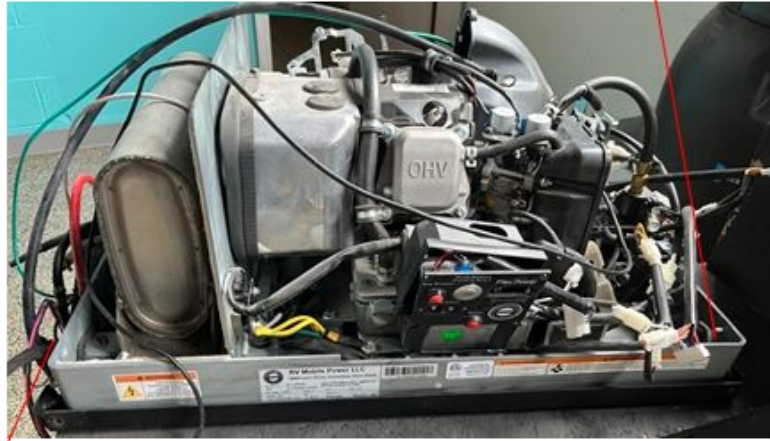
Battery ground cable connection

For the negative battery cable connection, it is recommended to run a single battery cable from the battery ground connection post on the left side of the generator directly to the negative terminal on the battery. This ensures a proper path back to the battery. However, in some applications the negative battery cable can simply be grounded to the steel on the chassis of the vehicle. If the latter approach is used, ensure that the negative battery cable has a good connection with the chassis. Conduct a visual inspection to ensure there is no rust or coatings that prevent proper electrical contact between the cable and the steel chassis. Wiggle the connection to see if it's loose and if so tighten or re-attach with a better connection. A multimeter can also be used to check the continuity at the connection point on the chassis with other known grounds.

Ground posts

The generator has two ground posts that can become loose and cause intermittent starting. The first post is on the exterior left hand side of the generator and is the location where the negative battery cable attaches to the generator. The second post is on the interior of the generator in the front right corner beneath the fuel selection switch where several internal ground wires are connected. Each of these locations are indicated in the figures below.

Internal ground post



Battery ground connection post



Battery ground connection post



Fuel selection switch

Internal ground post

To mechanically check each post, conduct a ‘wiggle’ test by grasping one of the wires connected to the post or the post itself and attempt to wiggle the post. If either post is loose, tighten accordingly.

To electrically check each post, use a digital multimeter placed on the resistance setting (Ω) to look for continuity:

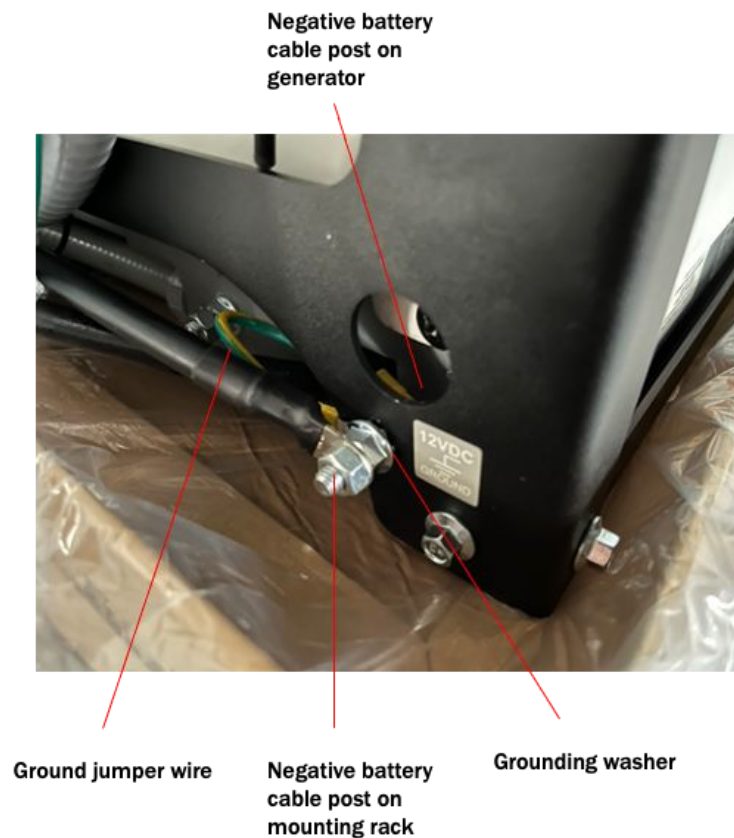
- A) between a known ground on the chassis or battery and the first exterior post. Place one probe on the known ground and the second probe on the first exterior post where the negative battery cable connects. The resistance should be zero.
- B) between a known ground on the chassis or battery and the second interior post. Place one probe on the known ground and the second probe on the second interior post underneath the fuel selection switch. The resistance should be zero.
- C) between the two posts. Place one probe on the first exterior post where the negative battery cable connects and the second probe on the second interior post underneath the fuel selection switch. The resistance should be zero.

If either A, B, or C produce a measurable resistance value with the digital multimeter, then there is a ground that does not have a good electrical connection with the ground posts and battery ground wire. Check each ground wire to ensure that it’s electrically connected properly and that no wires have been cut and/or damaged in any way that would prevent proper electrical connection.

Grounding jumper wire for mounting rack

When using the mounting rack with the generator, it can be difficult to access the first exterior post for the negative battery cable once the generator is placed within the mounting rack. Thus, a grounding jumper wire is sometimes used to connect the first exterior post for the negative battery cable with another post that is connected and grounded with the mounting rack itself. See the figure below for illustration. The design allows

for a faster installation when using the mounting rack, but care must be used to ensure the jumper wire is used and correctly installed.



As shown above, a proper grounding jumper wire would connect its first end to the first exterior post on the generator and its second end to the negative battery cable post on the mounting rack. It's imperative that there is a grounding washer placed between the second end of the jumper wire and the mounting rack to ensure that proper electrical connection is made between the two. The mounting rack is constructed of hardened steel which is then powder coated, so that proper electrical connection with the jumper wire may not occur unless a grounding washer is used, which will cut into the mounting rack slightly to ensure good metal to metal contact for the grounding wire.

- If a jumper wire is not used be sure that this is included (the generator may still start/run intermittently without a proper jumper wire).
- Ensure that a proper grounding washer is used or the mounting rack is sufficiently sanded and/or prepped to ensure good electrical connectivity.
- Also ensure that the wire's connections are not loose by conducting a 'wiggle' test.

Troubleshoot Issue #3: Generator completely dead, does not attempt to start and no lights illuminate on control panel.

Check battery

Check the battery for at least 12–13V DC. Use a multimeter to determine the battery voltage by applying the probes to the positive and negative terminals on either the battery itself or the terminals on the side of the generator which accept the positive and negative battery cables.

Check the battery for at least 450 CCA. For lead acid batteries, use a battery tester to measure the cold cranking amps (CCA) of the battery and ensure at least 450 CCA. For lithium batteries, ensure that the battery has a state of charge (SOC) of at least 25%.

Check fuses

A pair of in-line electrical fuses are placed adjacent to the front control panel and protect various aspects of the generator from damage. If a fuse is blown, then the generator will be completely dead and would have no response when the start button is pushed.

Small fuel module fuse

A single ten (10) amp fuse is used to protect the fuel module. This fuse can be blown if there is a short in the fuel pump or the fuel solenoid on the carburetor. Check this fuse and replace if necessary. If blown, be sure to check the fuel pump and fuel solenoid for proper operation before resuming operations of the generator, or else the new fuse will be blown as well.

Larger inverter fuse for 4000i

A single sixty (60) amp fuse is used to protect the inverter on the 4000i model. This fuse can be blown if the battery is connected backwards. Check this fuse and replace if necessary. If blown, be sure to check the battery connections before resuming operations of the generator, or else the new fuse will be blown as well.

Larger inverter fuse for 5500i

A single one-hundred (100) amp fuse is used to protect the inverter on the 5500i model. This fuse can be blown if the battery is connected backwards. Check this fuse and replace if necessary. If blown, be sure to check the battery connections before resuming operations of the generator, or else the new fuse will be blown as well.

Troubleshoot Issue #4: Generator starts but runs rough when the breaker is OFF with no electrical load on the generator.

Check throttle for proper operation

Even without an electrical load on the generator, there should be some movement of the throttle, although slight. After starting the generator, closely watch the throttle and throttle spring to see if there is any movement whatsoever. If there is no movement, there are several scenarios to check for. The throttle is located at the top of the carburetor, which is placed adjacent to the right side of the front control panel. Images below provide the location of the carburetor and a close up of the throttle and spring. When observing the proper function of the throttle, watch the black plastic throttle that is connected to the spring and there should be some movement of this throttle/spring for proper operations. If there is no movement, proceed to check the following.

Inspect wire harnesses

Check the wire harness for the throttle stepper motor and ensure that the wire harness is fully plugged in and engaged.

Check for a bad stepper motor

The stepper motor which controls the throttle is a digital stepper motor so it can be difficult to verify a failure in the motor aside from swapping out the questionable motor with a known working stepper motor. The

stepper motor contains a pair of mounting screws that can easily be removed to swap out the existing motor for a known operating motor.

Check for bad inverter

The inverter sends a digital signal to the stepper motor of the throttle to control the throttle depending on the electrical load of the generator. If there is no movement of the throttle, even if there is no load on the generator, it's possible that the inverter is damaged. Swap the inverter for a known working inverter to check for this.



Front control panel

throttle

Carburetor

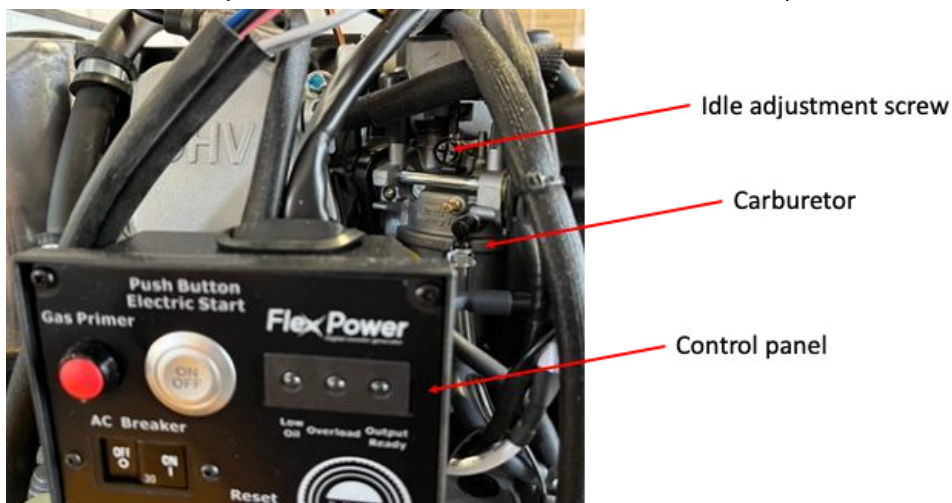


Throttle
Throttle spring
Idle adjustment screw

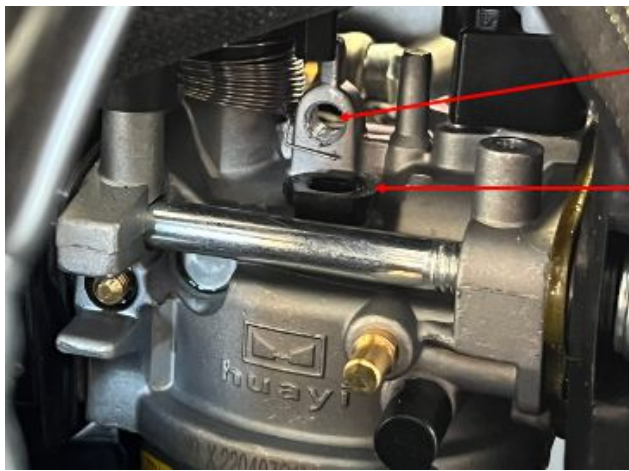
Check needle jet for dirt or obstructions

Inside the carburetor is a needle jet for vaporizing gasoline prior to ignition. In some instances there can be dirt or other obstructions that may clog this jet and cause the generator to run rough or begin “hunting” where the RPMs of the engine change rapidly as the generator searches for the correct amount of throttle. In order to inspect and clean the needle jet, following these steps:

1. Remove the front control panel cover door. There is no need to remove either the generator from its installed location or the top housing.
2. The carburetor and idle adjustment screw are located behind the control panel.



3. Carefully remove the idle adjustment screw with a large phillips head screwdriver, ensuring that the adjustment screw sticks to the end of the phillips head and does not fall down into the generator.



Hole for idle adjustment screw (now removed)

Needle jet

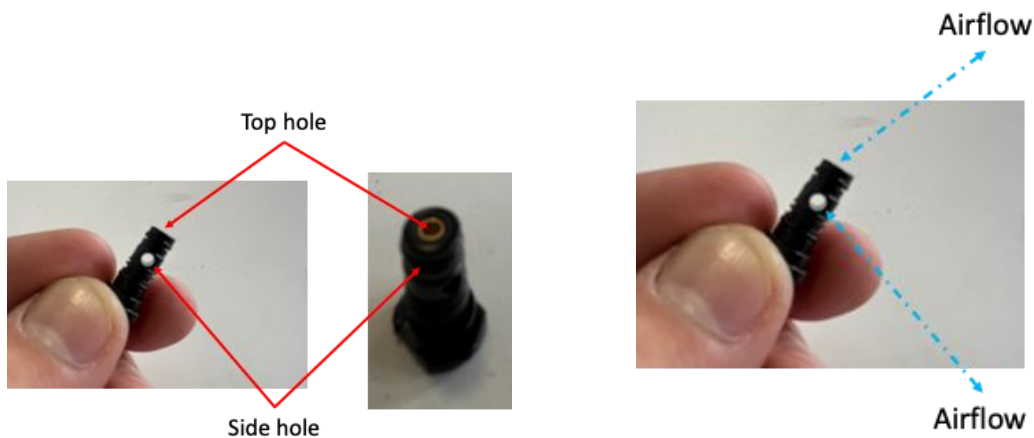
- Carefully remove the needle jet which is located directly underneath the idle adjustment screw. In most cases you can remove the needle jet by hand, but sometimes you may need to pry ***gently*** upwards on the needle jet with a flat head screwdriver to remove the needle jet. **Be careful not to drop the needle jet into the bottom of the generator.**



Needle jet

Small flathead screwdriver

- Clean out the small holes in the needle jet with carburetor cleaner or compressed air. For proper operation of the generator there should be unobstructed airflow through the needle jet.



Top hole

Side hole

Airflow

Airflow

- Re-install the needle jet. Rotate the needle jet until aligned properly. The needle jet is oblong and not circular, so it must be oriented properly to be fully seated into the carburetor. Once oriented properly, press down firmly and the needle jet should snap into place when fully seated.



Rotate the needle jet until oriented properly

Press down until seated in place

7. Re-install the idle adjustment screw with a phillips head screwdriver. **DO NOT OVERTIGHTEN!** The idle adjustment screw should be screwed in with little to no force, as the threads are plastic and could cross-thread. Carefully re-thread the screw into the hole and tighten until the screw is approximately halfway inside the hole. The idle adjustment screw if screwed all the way into the hole will increase the idle of the machine. There is not an exact setting for this screw, as the idle is set internally by the digital control parameters. This screw is a manual adjustment and will only engage when fully inserted. If you want to test the idle: screw the idle adjustment (while engine is running) until it bottoms out. You will hear a noticeable increase in the engine RPMs. Slowly back the idle adjustment screw out, in quarter turn increments, until desirable idle speed is achieved. **NOTE:** If the idle adjustment screw will not align properly with the threads, or the hole is slightly blocked by the needle jet, it is possible that the needle jet has not been fully seated in to the carburetor, and the orientation of the needle jet should be re-checked with further downward pressure applied to the needle jet to ensure its fully seated into the carburetor.

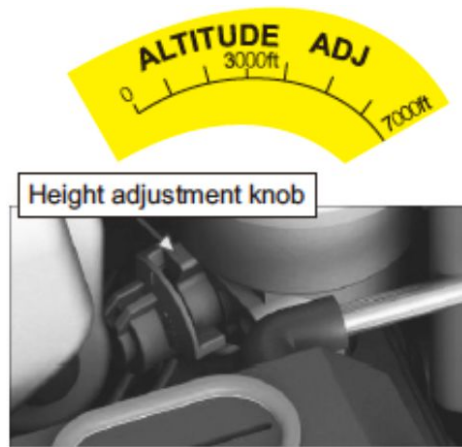


8. Start the generator and you should immediately recognize the elimination of the rough running or "hunting". It is likely that no additional adjustment is necessary.

Check proper setting on altitude adjustment

Generator performance will decrease at high elevations due to the reduced amount of oxygen available for combustion in the engine. To account for this, the carburetor contains an adjustment to improve performance at high altitudes. The generator comes from the factory with the altitude adjustment set for sea level. If you are operating the

generator at higher altitudes, you may experience rough running until the altitude adjustment is set to the correct level. If the generator is backfiring (running lean) turn the screw to the right to increase the altitude setting. If the generator is coughing or smoke is coming out of the exhaust (running rich) turn the screw to the left to decrease the altitude setting.



Clean old gas or buildup from carburetor

If the generator has been used previously, it is possible that there could be residue from old gasoline left in the carburetor. This residue can clog the carburetor and cause the generator to run rough.

Drain old gasoline

Drain all of the old gasoline out of the carb by loosening the green screw on the carburetor bowl and holding down the prime button to pump out the old gasoline. Fill with fresh gasoline.

Run with LP

Attach a tank of LP to the LP fuel line of the generator and switch over to LP (if available) as the fuel source for 5–10 minutes to burn off any residue from old or bad gasoline entering the carburetor. Switch back to fresh gasoline as the fuel source.

Clean carb with Sea Foam

Prepare a gallon of fresh gasoline and mix with Sea Foam cleaner. BEFORE DOING THIS BE SURE TO REMOVE ALL OLD GAS BY LOOSENING THE CARB BOWL DRAIN SCREW AND HOLDING DOWN THE FUEL PUMP BUTTON TO REMOVE ALL OLD GAS. Disconnect the gasoline supply line from the main tank and place the gasoline supply line into the vessel containing the Sea Foam/gasoline mixture so that it draws this mixture into the carburetor and does not draw gas from the main tank. Prime the fuel pump if the generator was not running previously, then run the generator on this mixture for about 10 minutes. Stop and wait for 10 minutes, and if necessary (for example to further clean out old gasoline deposits/residue) repeat and run the generator for another 10 minutes on this mixture. Remove the gasoline supply line from this mixture and re-connect to a supply of fresh gasoline.

Air filter inspection and cleaning

Check the air filter, clean with soap and water or replace if necessary. A clogged filter will prevent the adequate amount of air from being injected into the carb and will cause rough running.

Check for gasoline vaporization conditions

In some applications, the fuel line containing the gasoline can be located too close to other components on the RV that may heat up during operation (specifically the main exhaust for the RV chassis engine or the exhaust for the generator), where this heat can be transferred to the fuel line and eventually begin to vaporize the gasoline in the fuel line. Gasoline will begin to vaporize at 140° F (60° C) so when the gasoline supply line reaches this temperature, gasoline will quickly shift phases from a liquid to a gas. This makes the job of the fuel pump more difficult and eventually impossible to create enough pressure to cause liquid gasoline to flow in the proper amounts. This results in the generator being starved for fuel and eventually shutting down. To correct for this, check the routing of the gasoline fuel line to be sure it's located away from any heat-producing parts or assemblies, including the exhaust lines of the generator and the exhaust lines of any motorized chassis. The gasoline supply line must stay below 140° F or the generator will be starved for fuel as the fuel pump cannot move vaporized fuel.

Check for proper LP regulator pressure

When experiencing rough running when operating the generator on LP gas, ensure that the proper LP regulator is being used. High pressure LP regulators will not flow properly into the generator and it will run rough and you may smell LP leaking from the high pressure LP gas being forced with too much pressure into the generator. The generator only works with low pressure LP regulators producing 9.0 – 13.0 inches WC pressure.

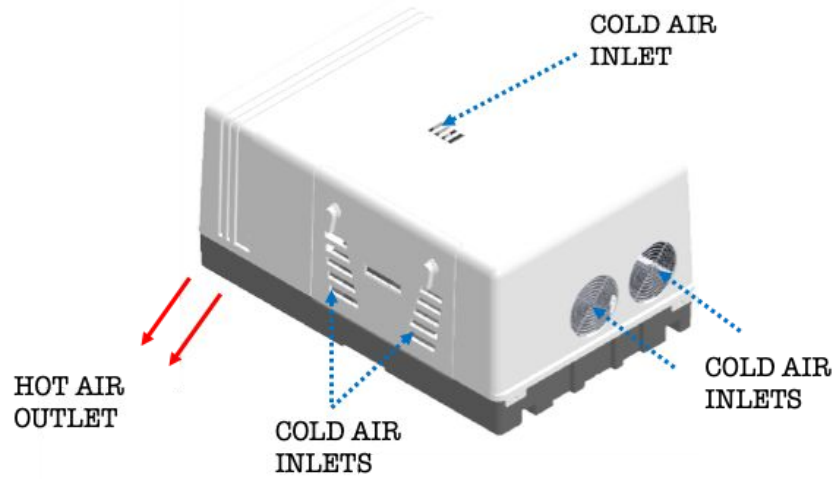
Check for low LP

Ensure that the LP tank is adequately full and not about to run empty and that the valve for the LP tank is wide open.

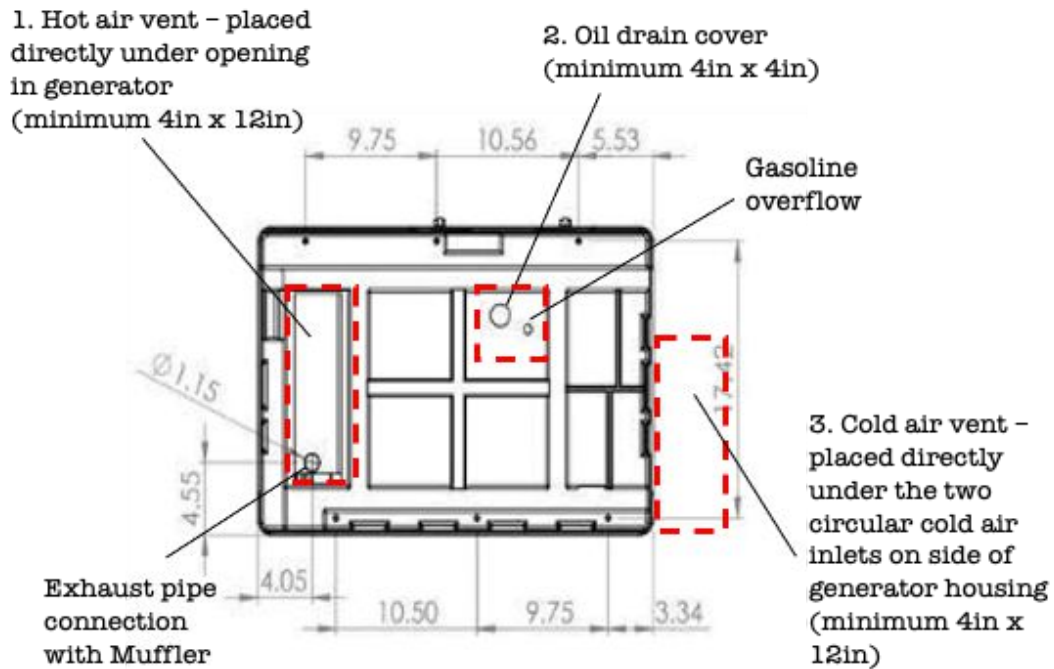
Troubleshoot Issue #5: Generator starts but only runs for a few minutes, then shuts down.

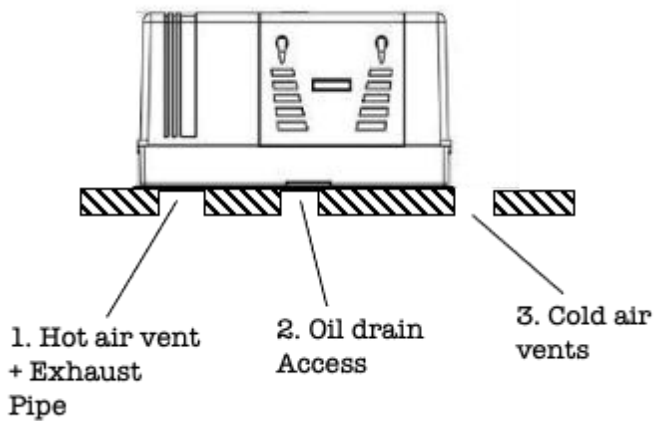
Check for proper ventilation

If there is no electrical load on the generator (i.e. the AC breaker on the control panel is in the OFF position), but the generator is turning off after 5–10 minutes of run time, the generator could be overheating. See the Installation Manual Section 5.5 Ventilation for additional details on how to ensure the generator can adequately cool itself during operation. Note the figure below taken from the Installation Manual which shows the cool air inlets and hot air outlets.



It's imperative that these paths of air are kept separate and cannot mix with one another. If air from the hot outlet is ingested back into the cold air inlets, the generator will not be able to cool itself because it will be ingesting hot air back into the cooling inlets. In this situation you will see a steady increase in temperature until there is a thermal shutdown. The generator contains several thermocouples to measure the temperature inside the generator and when this approaches a dangerous threshold the generator will shut down and may not restart until temperatures have returned to a safe operating temperature which could take between 5 and 15 minutes depending on how hot the ambient conditions are.





1. Mark the location for the hot air vent and the exhaust pipe to pass through the substructure and remove this portion of the substructure.
2. Mark the location for the oil drain and gasoline overflow to pass through the substructure and remove this portion of the substructure.
3. Mark the location for the cold air vent for plenty of cold air to enter the compartment.
4. Remove these areas from the substructure.

Ensure plenty of fresh clean air is supplied into the cooling fan side of the generator (the right hand side where the large circular cold air inlets are shown), and nothing is blocking the cold air inlets to the generator. Further ensure that any compartment has adequate venting to allow fresh air into the compartment for cooling the generator. If the generator is placed within a compartment there should be large holes placed in the floor of the compartment and the door to ensure hot air can exit the compartment and cool air can enter the compartment and that these flows do not mix.

Check for gasoline vaporization conditions

In some applications, the fuel line containing the gasoline can be located too close to other components on the RV that may heat up during operation (specifically the main exhaust for the RV chassis engine or the exhaust for the generator), where this heat can be transferred to the fuel line and eventually begin to vaporize the gasoline in the fuel line. Gasoline will begin to vaporize at 140° F (60° C) so when the gasoline supply line reaches this temperature, gasoline will quickly shift phases from a liquid to a gas. This makes the job of the fuel pump more difficult and eventually impossible to create enough pressure to cause liquid gasoline to flow in the proper amounts. This results in the generator being starved for fuel and eventually shutting down. To correct for this, check the routing of the gasoline fuel line to be sure it's located away from any heat-producing parts or assemblies, including the exhaust pipe of the generator and the exhaust pipe of any motorized chassis. The gasoline supply line must stay below 140° F or the generator will be starved for fuel as the fuel pump cannot move vaporized fuel.

Check for proper LP regulator pressure

When running the generator on LP gas and there is a shutdown within a few minutes, ensure that the proper LP regulator is being used. High pressure LP regulators will not flow properly into the generator and it will run rough and you may smell LP leaking from the high pressure LP gas being forced with too much pressure into the generator. Eventually the generator may shut down completely. The generator only works with low pressure LP regulators producing 9.0 – 13.0 inches WC pressure.

Check for restrictions to gasoline line

If the generator is starting but will not stay running, check the gasoline lines from the tank to the generator to ensure that there are no kinks or bends. Also check to make sure that a clip or zip tie has not closed off the flow of gasoline through the fuel line or constricted it in any way. If the fuel line is being restricted you should hear the fuel

pump begin to get louder once there is no fuel or a small amount of fuel within the pump. If you hold down on the prime button and the fuel pump gets louder and/or makes a ‘clicking’ sound, there is either no fuel or a small amount of fuel getting into the fuel pump, and therefore some type of restriction in the gasoline line.

Check for vacuum lock in the gasoline line

If the generator is starting but will not stay running, check the gasoline lines for possible vapor lock. When drawing gasoline from a tank that contains a separate fuel pump for the RV chassis engine or a fueling station, this can create a vapor lock in the gasoline line that will prevent the fuel pump of the generator from overcoming the vacuum and drawing fuel into the generator. If this occurs, you should hear the fuel pump begin to get louder once there is no fuel or a small amount of fuel within the pump. If you hold down on the prime button and the fuel pump gets louder and/or makes a ‘clicking’ sound, there is either no fuel or a small amount of fuel getting into the fuel pump, and there could be a vapor lock preventing fuel from getting to the generator.

In these situations, the gas cap on the gasoline tank can be loosened to allow the vacuum to release. However, DO NOT leave the gas cap loosened as gas may be able to spill out of the tank when the RV is moving. Be sure to tighten the gas cap before you move the RV or fuel could spill. If you are consistently experiencing vapor lock, explore the use of a vented gas cap on the tank that will allow air into the tank and remove the vacuum.

Troubleshoot Issue #6: Generator starts and runs but there’s no power output.

Check for electrical overload

If there is an electrical load on the generator (i.e. the AC breaker on the control panel is in the ON position), and the generator starts and output power initially but the generator stops outputting power after a few minutes of run time while the engine stays running, the generator could be electrically overloaded. Check the overload light on the control panel. If illuminated, turn off any electrical devices with a large power draw (ex. Air-conditioners, hair dryers, vacuums, microwaves, heaters, heated blankets). Press and hold the OVERLOAD RESET button on the control panel until the overload light goes out and the READY light illuminates again. Carefully re-start electrical devices one at a time ensuring that the total power draw does not exceed the generator’s max power output. Air-conditioners especially have a very large power draw during their initial ramp up, so ensure that you start an air-conditioner by itself with no other appliances running, and allow it to fully power up and reach a steady state before starting other appliances.

Check for bad inverter

If the generator starts and runs but there is no 120V output, there could be a failure in the inverter. You can observe this failure by looking at the digital display on the front of the unit once the generator starts and pressing the option button on the display until the output voltage is displayed. If zero volts is indicated on the display for the output power then it’s likely the inverter is bad. This can also be checked by placing a multimeter on the two 120V AC output wires and see if there is proper voltage output. If not, the inverter is likely bad and needs replaced.

Instructions for replacing fuel pump

1A. Locate the fuel pump and follow the fuel pump wires to the right until reaching the fuel pump wire harness (located just to the right of the inverter against the wall of the housing). Unplug the wire harness. If the harness cannot be reached or unplugged, see alternative method in Step 1B described below.



inverter **Fuel pump** **Fuel pump wires** **Fuel pump wire harness**



Fuel pump wires
Fuel pump wire harness

1B. Alternative method – In some situations it may be difficult to reach the wire harness and unplug the harness while the exterior housing is in place. In these situations, simply clip the wires next to the fuel pump and butt splice them

back together with the new fuel pump. Locate the fuel pump and follow the fuel pump wires until reaching the fuel pump wire harness (located just to the right of the inverter). Unplug the wire harness (if reachable).

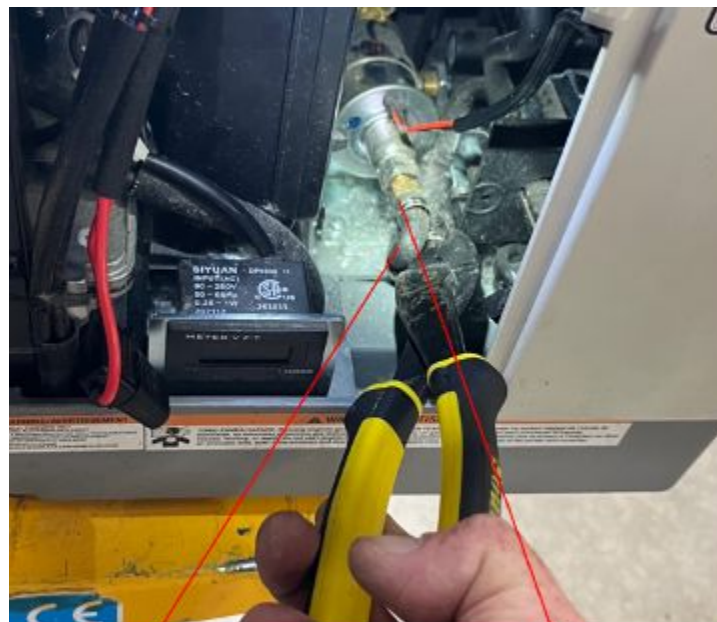


Fuel pump

Fuel pump wire harness

Cut fuel pump wires here and butt splice in the wires for the new fuel pump

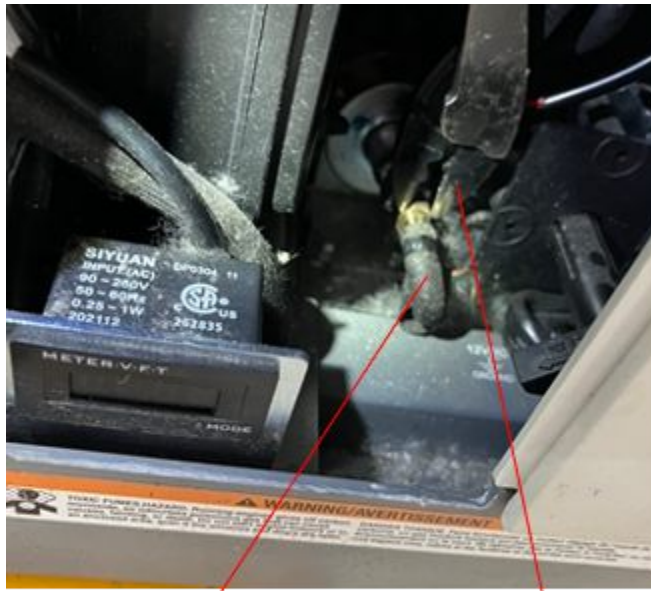
2. Locate the outlet hose coming from the fuel pump (the outlet hose is on the front side of the fuel pump, closest to the front door). Remove the hose clamp that attaches the outlet hose to the fuel pump outlet by prying the clamp away from the hose or snipping the clamp off.



Outlet hose

Outlet hose clamp

3. Slide the outlet hose off the fuel pump by hand or by placing a tool between the hose and the fuel pump and carefully prying/sliding the hose off the fuel pump.



Outlet hose

Tool for sliding outlet hose off the fuel pump outlet



Fuel pump with outlet hose removed

4. Locate the worm clamp that wraps around the fuel pump and secures the fuel pump to the mounting bracket beneath the fuel pump. Use an 8 mm socket to loosen the clamp enough to slide off the mounting bracket below.



Worm clamp that secures fuel pump to mounting bracket

8mm socket head on worm clamp

5. Locate the incoming gasoline line coming into the generator and make sure there is some slack in this line (a minimum 8 inches – 12 inches of slack will be needed). If necessary, remove any zip ties or other retaining means that may secure the extra fuel line beneath the RV. This extra fuel line slack will be necessary so that the fuel pump can be removed without having to disconnect from the input side of the fuel pump (which is difficult to reach without pulling the fuel pump out of the front door). Slide the fuel pump off the mounting bracket and pull the fuel pump out of the front door slowly while feeding the extra fuel line slack into the generator housing. Pull until the fuel pump is outside the door and the inlet hose on the inlet side of the fuel pump is now accessible.



Slide fuel pump out of the front door while feeding extra fuel line slack into the generator

Incoming fuel line – pulling slack from outside the generator

6. Locate the brass elbow on the inlet side of the fuel pump and where it connects to the square fitting. Grasp the brass elbow with locking pliers while using a 9/16 inch open ended wrench to simultaneously grasp the square fitting. Unscrew the brass elbow from the square fitting.



Square fitting

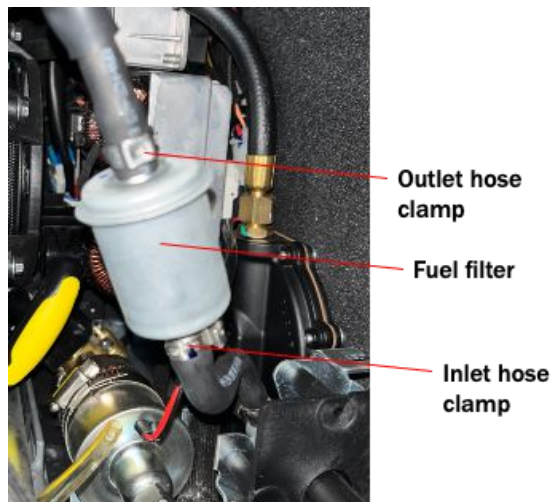
**Brass elbow on
inlet side**

7. Perform steps 1 through 6 in reverse to install the new fuel pump.

Instructions for replacing the fuel filter

The following instructions are for replacing the fuel filter in a 4000i model generator.

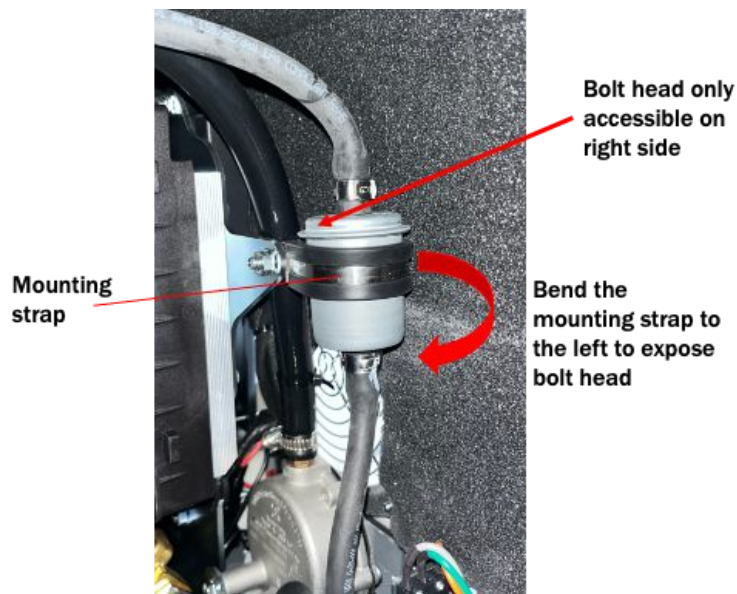
1. Locate the fuel filter inside the front door and to the right of the airbox and above the fuel pump.
2. Remove the outlet hose clamp and remove the outlet hose from the fuel filter.
3. Remove the inlet hose clamp and remove the inlet hose from the fuel filter.



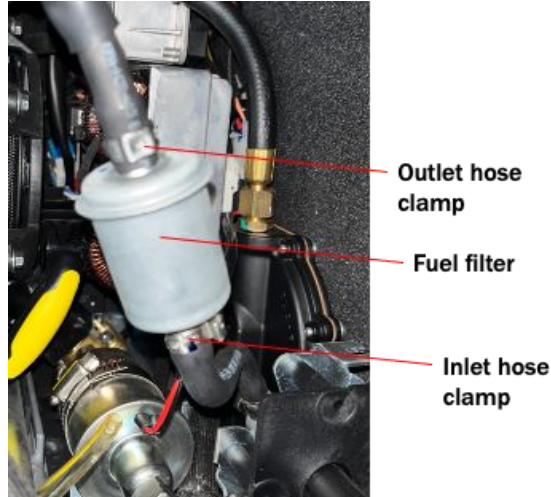
4. Install a new fuel filter by connecting the inlet hose to the inlet side of the new fuel filter and installing a new hose clamp to secure the inlet hose to the new fuel filter.
5. Similarly, connect the outlet hose to the outlet side of the new fuel filter and install a new hose clamp to secure the outlet hose to the new fuel filter.
6. Double check the orientation and markings on the fuel filter to make sure the INLET side of the fuel filter is connected to the inlet hose while the OUTLET side of the fuel filter is connected to the outlet hose.

The following instructions are for replacing the fuel filter in a 5500i model generator.

1. Locate the fuel filter inside the front door and to the far right of the housing, mounted with a mounting strap to a plate extending from the inverter assembly. Note that the bolt head for detaching the mounting strap is found on the right hand side and difficult to access. To provide access to the bolt head, grasp the mounting strap and rotate the strap to the left so that the bolt head can be accessed.



2. Loosen the bolt on the right hand side to remove the mounting strap from the inverter plate and remove the fuel filter from the mounting strap.



3. Remove the outlet hose clamp and remove the outlet hose from the fuel filter.

4. Remove the inlet hose clamp and remove the inlet hose from the fuel filter.

5. Install a new fuel filter by connecting the inlet hose to the inlet side of the new fuel filter and installing a new hose clamp to secure the inlet hose to the new fuel filter.

6. Similarly, connect the outlet hose to the outlet side of the new fuel filter and install a new hose clamp to secure the outlet hose to the new fuel filter.

7. Double check the orientation and markings on the fuel filter to make sure the INLET side of the fuel filter is connected to the inlet hose while the OUTLET side of the fuel filter is connected to the outlet hose.

8. Re-use the mounting strap to wrap around the new fuel filter and secure the strap and new fuel filter to the inverter plate with the bolt.

Instructions for replacing the carburetor

The following instructions are for replacing the carburetor in a 4000i model generator. The process for replacing the 5500i is nearly identical, but there can be some variation to the images and exact location of some hoses. Otherwise the process for both the 4000i and the 5500i is the same.

1. Locate the carburetor behind the large bundle of wire harnesses and snip the zip tie for the wire bundle so that the wires can be moved out of the way to provide access to the carburetor.



Carburetor (behind this bundle)

Wire harness bundle zip tie

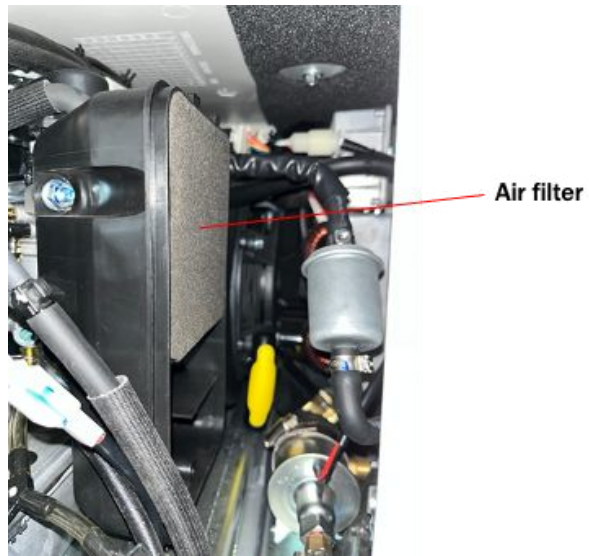
2. Locate and remove the airbox cover securing screw at the bottom of the airbox cover. Remove the airbox cover screw and the airbox cover.



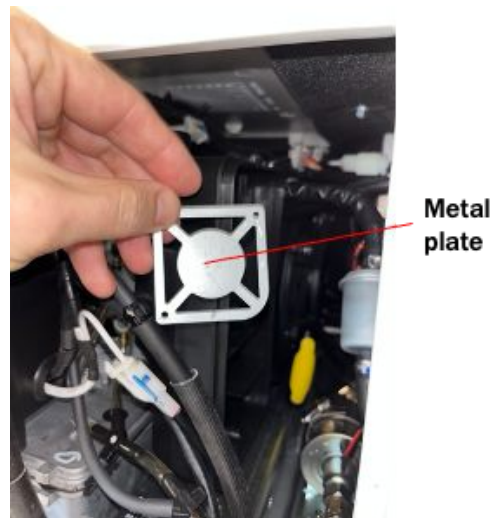
Airbox cover

Airbox cover securing screw

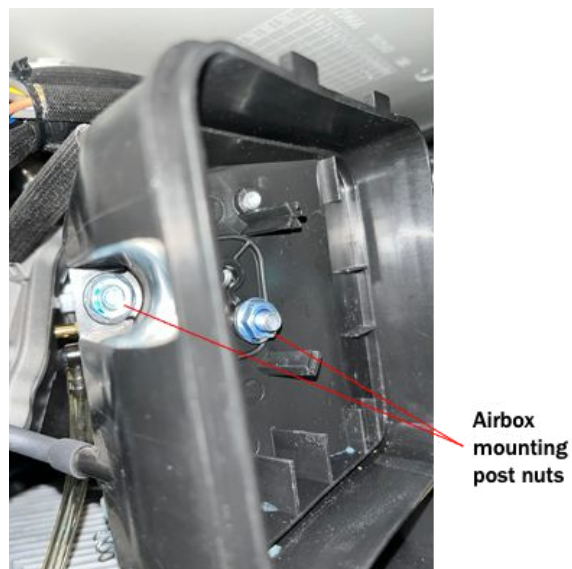
3. Locate and remove the air filter inside the airbox.



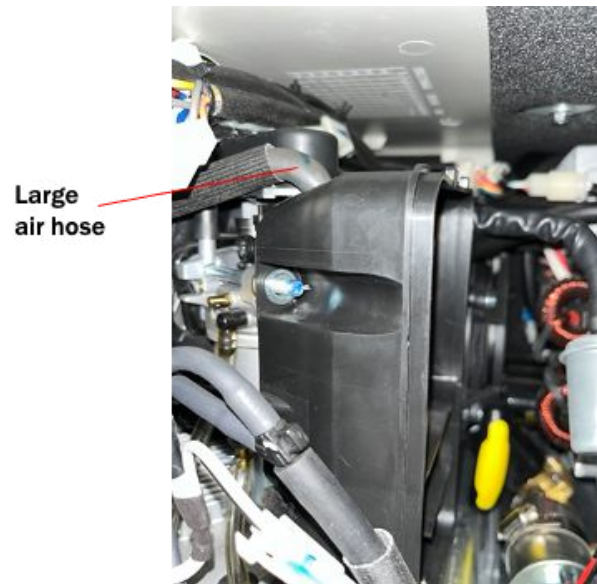
4. Locate and remove the metal plate behind the air filter.



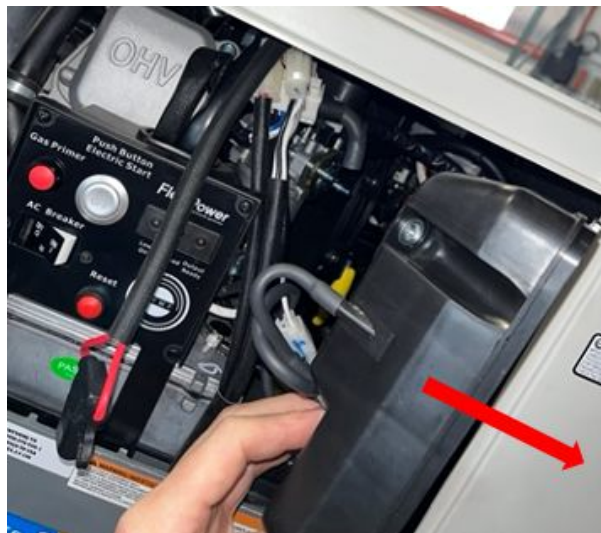
5. Locate the mounting posts for the airbox and the nuts that secure the airbox to the posts. Remove the two (2) nuts with a 10 mm socket.



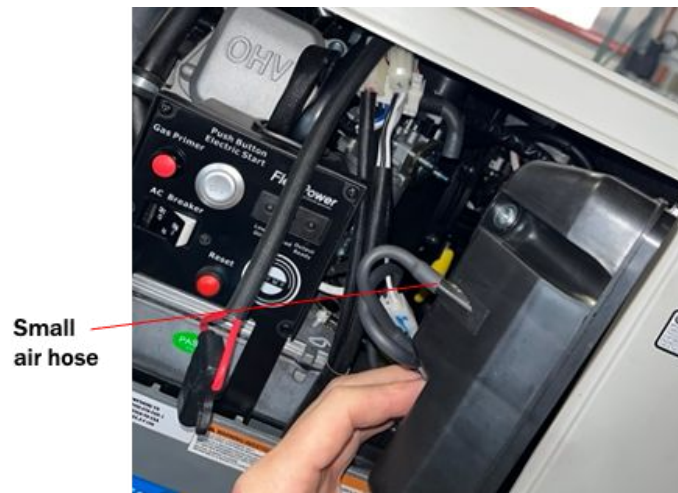
6. Locate and remove the large hose that connects to the top of the airbox.



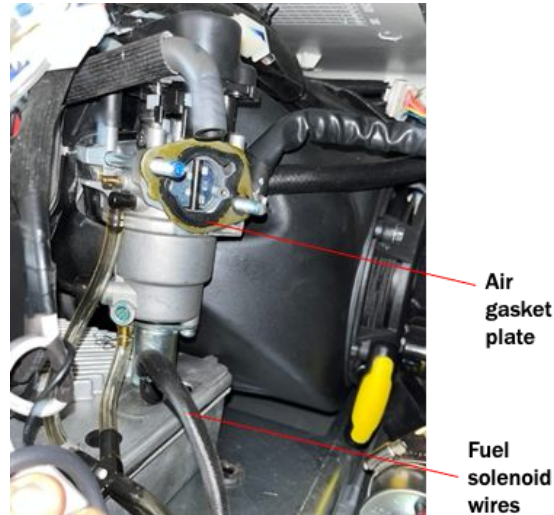
7. Slide the airbox to the right and off the mounting posts.



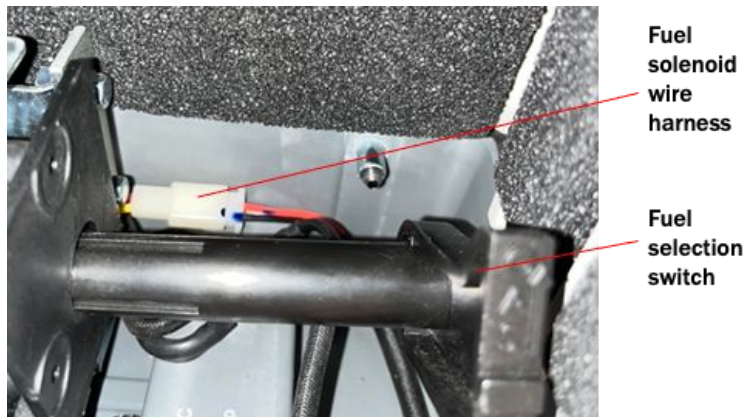
8. Disconnect the small air hose from the airbox and remove the airbox completely from the generator housing.



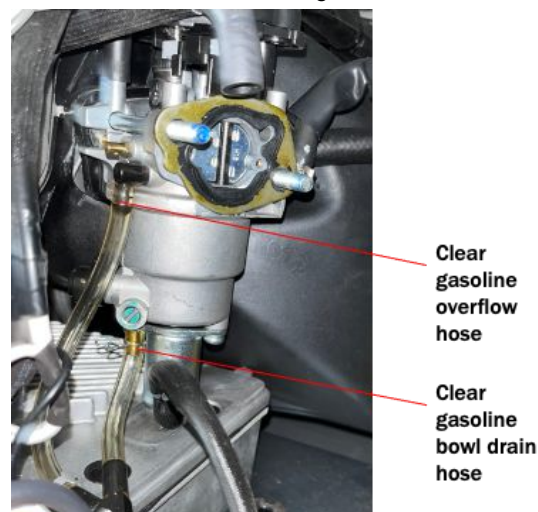
9. Pay close attention to the air gasket plate located on the side of the carburetor between the carb and the airbox. This gasket plate can be removed at this point and kept for reassembly later, or it can be left in place until the carburetor is removed from the mounting posts later.



10. Locate the fuel solenoid wire harness by following the fuel solenoid wires from the bottom of the carburetor to the interior front right hand corner of the housing behind the fuel selection switch. Disconnect the wire harness. (Alternatively, if the harness cannot be reached and/or disconnected, snip the wires and butt splice the wires for the new carburetor with the old wires.)



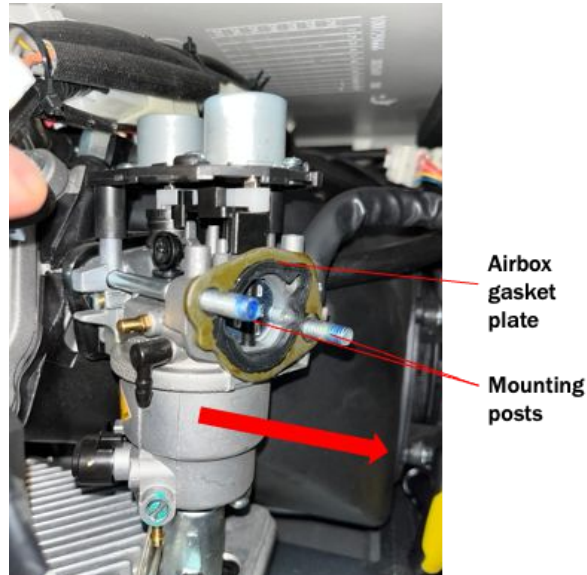
11. Disconnect the two clear hoses on the front of the carburetor. The clear hose at the top is a gasoline overflow hose while the clear hose at the bottom of the carburetor is the gasoline bowl drain hose.



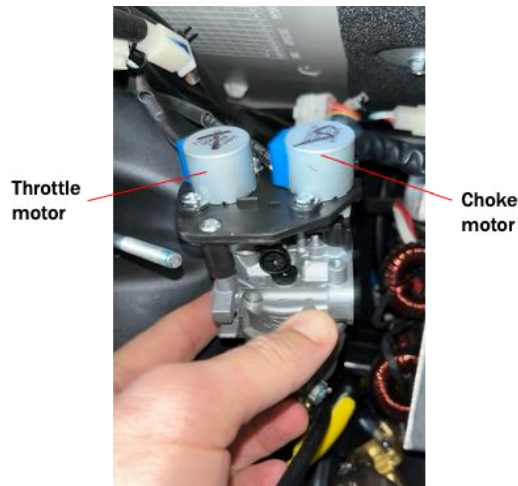
12. Remove the black cover at the top of the carburetor which covers the stepper motors that control the throttle and choke. The cover snaps on/off without any fasteners.



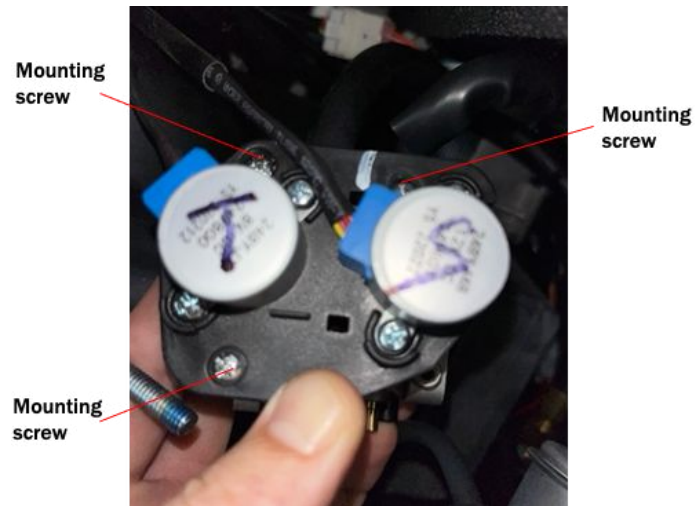
13. Slide the carburetor to the right, removing it from the two horizontal mounting posts. Remove and keep the airbox gasket plate (if not removed already in a prior step).



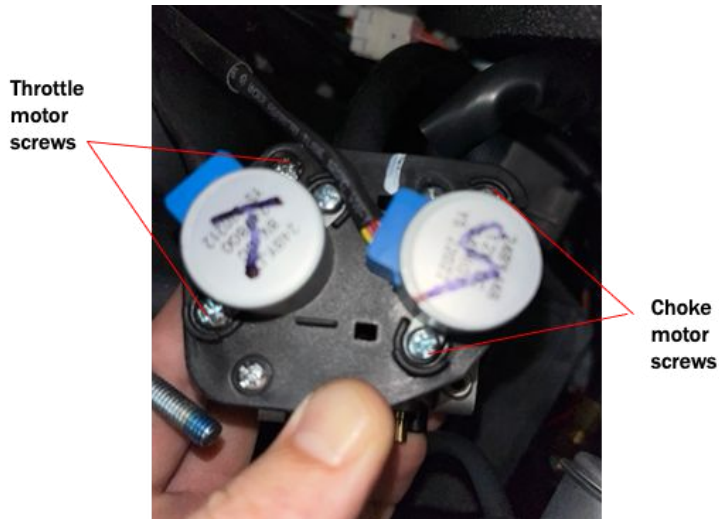
14. Rotate the top of the carburetor towards you so that you can mark the top of each motor with identifiable markings for easy reassembly. Mark the throttle motor on the left with a first marking and the choke motor on the right with a second marking so that they are correctly reassembled later.



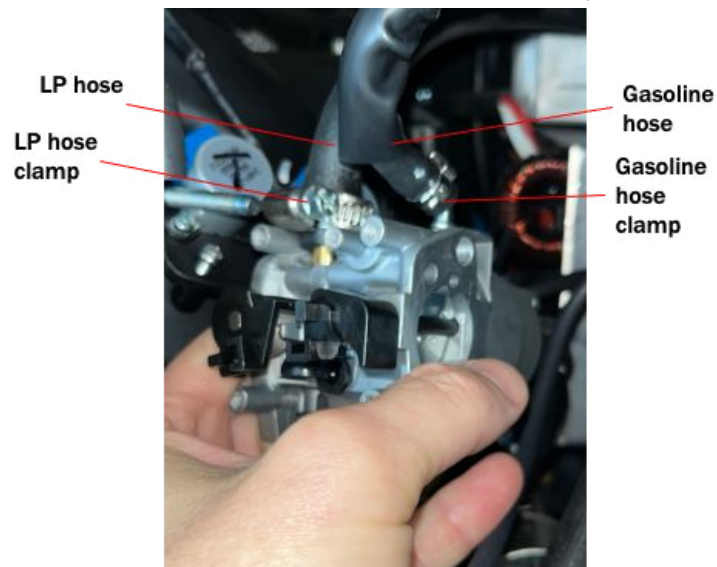
15A. Remove three (3) mounting screws from the motor plate which holds the throttle motor and choke motor. Once the mounting screws are removed, separate the plate and motors from the carburetor.



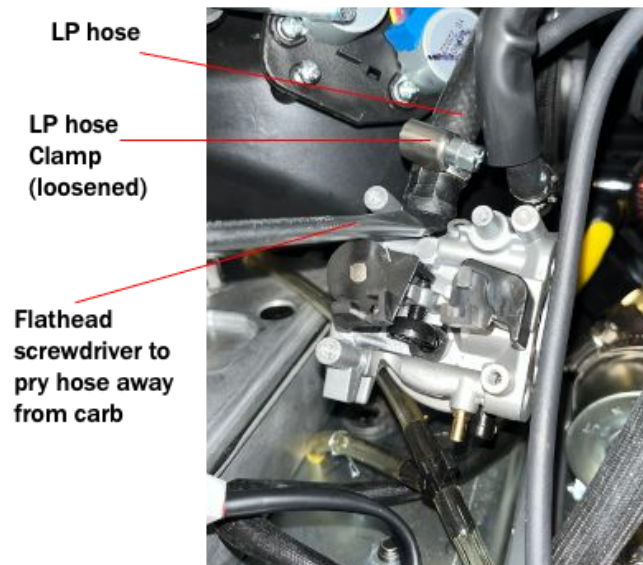
15B. Alternatively, if the mounting screws for the plate cannot be removed, remove two motor screws for each motor, four (4) screws total. Once the motor screws are removed, separate the motors from the plate and carburetor.



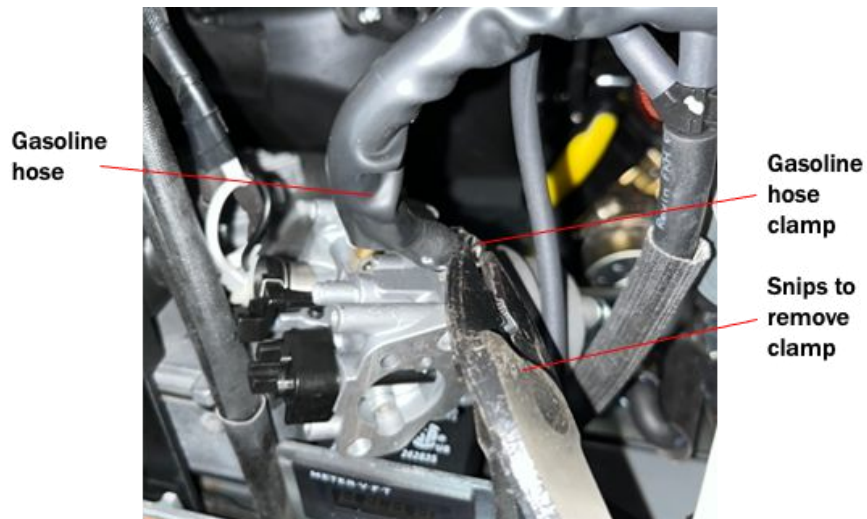
16. Locate the LP hose entering the back side of the carburetor and the clamp which secures the LP hose onto the carb. Loosen the LP hose clamp with a screwdriver or nut driver and slide it away from the carburetor.



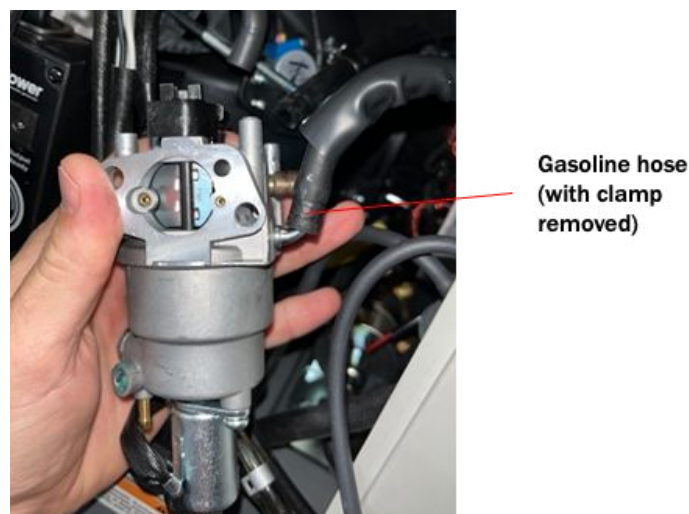
17. Use a flathead screwdriver (or similar) to pry the LP hose away from the carburetor. Slide the LP hose off the carburetor.



18. Use a pair of snips (or similar) to cut and remove the clamp which secures the gasoline hose to the carburetor.



19. Remove the gasoline hose from the carburetor by sliding the gasoline hose away from the carburetor using a tool to pry the hose away from the carburetor if necessary.



20. The old carburetor can now be completely removed from the generator. Perform steps 1 through 19 in reverse to install the new carburetor.



Remove old carburetor and replace with new

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