

HAFC Install on Stationary Carbureted Engines

The Fuel Cell portion of the install will be the same as any other installation. The electrolyte concentration should yield 15 amps at 13 or so volts after a 30 minute warm-up cycle.

The Vaporizer may provide for *too much* thermal energy on a stationary carbureted engine. If the engine exhibits vapor lock characteristics with the vaporizer installed, remove it from the heat source, but keep it in place so that the ionization effect is still working. If there are no issues with vapor lock, then use the Vaporizer.

The Covalizer should also be used as with any other installation; 3-5 oz per 10 gal.

Since the stationary generator is carbureted and devoid of electronic engine management controls, the O₂ptomizer will not be required for a successful installation. Instead, manual changes must be made to alter air-fuel ratio and ignition timing.

If there are jets available for the generator, this will be the preferred method of altering the air-fuel ratio. Some older carburetors may even have an adjustment screw that will allow you to change the air-fuel ratio. Smaller jets should be installed (or the mixture screw turned) on a trial-and-error basis to find that “sweet spot”. If the generator’s governor is electronic, and can provide a digital rendering of throttle angle, then lean out the jets for the smallest throttle angle for a given load (least amount of throttle opening). This means the generator needs to be loaded with a fixed value for all of the tests in the tuning phase.

If there are no numbers to look at with the governor, then the throttle should be fixed; disconnected from the governor and operated manually. Insert a spacer that will hold the throttle steady, regardless of load. Try different jets until the highest RPM is realized. This should give you the optimal air-fuel ratio for that particular engine.

If you don’t have jets available for the carburetor being used, and there is no mixture adjustment screw, then a compromise tuning process can be used. **It is by far preferable to change jets or turn a mixture adjustment screw to alter AFR than the following procedure!** However, if you cannot get access to different jet sizes, then this alternative method may be used.

If there is a vacuum line coming from the base of the carburetor, “T” into this line and install a small (1/8”) needle valve in this line. The other side of the needle valve should be directed to filtered air. You can either install an automotive fuel filter or route the line to the engine’s air cleaner (filtered side). Using this valve, you can induce a controlled vacuum leak. This will let air into the engine that doesn’t go past the fuel metering circuit. By turning the needle valve, you can lean out the mixture. The generator should be given a fixed load that is representative of an average load the generator will see on a regular basis. Whenever the load is lighter than this fixed load, the mixture will be a bit on the lean side. Whenever the load is greater than this test load, the mixture will be richer. Again, this process is a *compromise*.

Once the air-fuel ratio is set, then the ignition timing needs to be maximized. If the engine is equipped with a distributor, you will be able to get even greater gains by retarding the timing. Timing should be changed in 2 degree increments to get maximum RPM at a fixed load. The test procedure is similar to adjusting the air-fuel ratio, except that you are adjusting the ignition timing instead. If the engine is magneto driven with no means to adjust timing, then obviously the ignition timing procedure won't be used.

After the ignition timing is maximized, go back and double check the air-fuel ratio to ensure that it is still at optimal levels. It is possible that the change in ignition timing may allow for further fine tuning of the AFR.

If you have several generators with the same engine and carburetor, you can take the time to tune the first one, then simply duplicate the settings on the rest. This will speed things up for you, and should be real close on the rest.