

Vortex Fuel Saver Complete Combustion Techsm

Welcome to the Vortex Fluid Optimizer World of Advanced Magneto Hydrodynamics (MHD). You have made a smart and important decision in representing the Vortex environmental and money/fuel saving technology.

The **Vortex Fuel Saver** with Advanced Combustion Techsm is the result of 28 years of research in the development of treating fuel and air with specific electromotive charges that increase the ionization of oxygen and fuel resulting in higher combustion efficiency. The **Vortex Fuel Saver** Technology is tested worldwide to provide fuel and money savings while reducing emissions for cleaner, healthier air.

Magnetic fuel conditioning is an intricate science and a specialized technology. Through the years, many companies have designed fuel magnets with varied and poor results. These poorly designed magnets do not test or work well and have created a bad reputation for the technology. The reason for the poor results is that making fuel burn better requires engineering the correct stoichiometry – the science of gases and combustion such as the very important fuel/air mixture which, if improper, will not burn right. In addition, the proper electromotive charge potentials must also be maintained to maintain the stoichiometric ratio.

The Vortex Advanced Combustion Techsm was specifically engineered to maintain the correct stoichiometry while the gas is charged to increase the BTU (power). The Advanced Combustion Techsm System treats the fuel, air and cylinders with the correct electromotive ratio.

Vortex Fuel Saver

Fuel, like most liquids, forms chemical associations or grapelike molecular clusters; when the natural clustered fuel molecules are ignited, the flame naturally burns from the outside into the middle as the oxygen cannot ionize with the interior bound molecules. This results in an inefficient burn with many unburned fuel molecules emitting as carbon monoxide and hydrocarbons.

The **Vortex Fuel Saver** is based on Ortho-Hydrogen technology used by NASA in their hydrogen rockets to increase its BTU output. Magnetizing fuel is specifically referenced in the *CRC Handbook of Chemistry and Physics*, the engineer's handbook, and shows the actual BTU increase from properly energizing complex hydrocarbons.

The **Vortex Fuel Saver's** powerful magnetic unipolar double vortex field applies a strong electromotive force into the fuel which energizes the molecules with the same charge. Since like-charges repel, the clustered molecules separate into full atomization and only fully atomized gas can burn efficiently.

Vortex Fuel Saver System Placement¹

The **Vortex Fuel Saver** Double Vortex system is simply secured around the fuel line that supplies the fuel injection system or carburetor. In today's sophisticated cars, that line is available:

1. On the top side of the engine
2. Under the car between the engine and chassis, in which case, it will have to go on a lift for installation

¹ See **Vortex Fuel Saver** Installation Instructions

In most recent American cars, fuel injection is used. Most fuel injection engines [with the exception of single fuel line in older cars such as the straight 6 cylinder Jeep, etc.] have two lines from the gas tank to the fuel injection system. One is the supply line to the system and the other is the return line to the tank. Simply attach the Fuel System to the flexible supply line between the chassis and the engine injection system as shown in the Installation Instructions.



***NOTE:** It is crucial the Fuel System is placed on the supply line. It has happened that the system was improperly put on the return line and of course gave no results. If you are not sure about the supply line, please ask your mechanic. The fuel line often says "Fuel" on it or will come out of a filter along the chassis. Picture Left shows System on fuel line.

If you are unsure about which line is the fuel line, one way of confirming the proper line is to squeeze the line while someone turns the car on. If you feel the pressure building in the line you are squeezing, it is further confirmation that you may be correct.

On carburetors, simply put the Fuel System on the supply line close to the carburetor; if there is no space, simply attach it to the flexible supply line between the engine and chassis. On carbureted cars, it may be necessary to adjust fuel/air fast idle jet. This is simply an indication that the **Vortex Fuel Saver** is working and has increased the fuel's energy output.

***IMPORTANT Installation Note:** Many people have gotten hurt from jacking up their car and getting underneath without using jack stands. **IF ACCESS BENEATH THE VEHICLE IS REQUIRED, WE RECOMMEND HAVING A MECHANIC INSTALL THE SYSTEM** as they have the lift and the know-how to correctly install the **Vortex Fuel Saver**.

Safety Strap: When installing the **Vortex Fuel Saver**, please make sure the installer uses the additional short safety strap to secure the Fuel Unit to the chassis or engine so that it does not weigh down the flexible fuel line.

Vortex Quadruple Air Optimizer



the installation instructions.

The Vortex Quadruple Air Optimizer was engineered to apply the correct charge values to the oxygen to maintain the correct stoichiometric energy ratio with the fuel for increased combustion efficiency. Essential to the increased combustion efficiency, the system simply secures around the rubber or plastic section of the air intake system generally after the filter as shown. They are the easiest to secure. To ensure safety, two long straps are doubled and placed through the attachment holes as shown in

IMPORTANT: It is recommended to make sure there is a clean or new air filter when installing the **Vortex Fuel Saver**. Optimized fuel requires the full air input of a clean air filter. If the filter is dirty, the optimized fuel will be oxygen starved and the mileage cannot go up.

NOTE: If the mileage goes down later, it is an indication the air filter is dirty and must be changed.

The Vortex Coolant Optimizer

The Vortex Coolant Optimizer was designed to make sure the combustion chamber is fully energized to increase burning efficiency to its highest engineered level.



The Vortex Coolant Optimizer charges the cylinder walls to keep the treated gas from losing any of its energy. Simply secure to the lower side of the upper radiator hose, the system is put on the lower side of the hose because the coolant often does not fill up the hose, but is always on the lower side where the system can energize it.

A highly effective system for maintaining increased combustion efficiency, the Vortex Coolant Optimizer also has the added benefits of keeping the engine running at optimal temperature by dissolving any scale in the head, radiator and heating system. This is important as the scale can build up and cause overheating. The system also energizes the oil which through the years has been reported to last longer. A cooler running engine is a longer running engine.

NOTE: It is recommended for best performance that the engine's oil be changed. When the more complete combustion occurs from the Vortex system, clean, fresh oil will help seal the combustion chamber better for higher overall performance.

Stabilization Period

The Stabilization Period is the time it takes for the Optimizer system to reach full efficiency. The Stabilization Period generally takes three tanks of fuel, but gives good results during the period. During stabilization, economy and emissions will fluctuate until the following issues are accommodated:

1. Varnish and particle build-up clogging the fuel lines and jets of injection or carbureted engines is a normal by-product of fuel. This creates bad fuel spray patterns which lead to poor burning. The **Vortex Fuel Saver** system will magnetically re-absorb the varnish and particulate to normalize spray patterns.
2. To magnetically saturate the steel fuel line and/or fuel rail between the Fuel Optimizer installation and the combustion chamber. Previous to full magnetic saturation, the steel line and/or steel parts of the fuel system will absorb some of the energy of the fuel until the steel parts get fully saturated. Once fully saturated, the fuel will stay completely energized and give its highest state of combustion efficiency and increased mileage.
3. The **Vortex Fuel Saver** has shown to burn off the carbon in the compression ring within 2-3 months reseating the ring so that compression goes up. Smoke from blow-by has shown to disappear while mileage increases as the combustion seal gets better.

After the Stabilization Period, owners report the engine runs smoother, starts easier. Many owners report using Regular Octane fuel working like High-Test; saving money at the pump with each gallon or liter.

Emissions' testing is a quick method to determine the efficacy of the **Vortex Fuel Saver**. Since hydrocarbons (HC) and carbon monoxide (CO) emissions are unburned fuel, any reduction of those emissions indicates an increase in combustion efficiency and mileage.

It is important to note that a new car with a new catalytic converter will not show many HC or CO emissions, but will show a decrease in NO (nitrous oxide) after installation. This is also an indication of the Vortex system working as the oxygen is being used more efficiently and less is available to bond with the nitrogen and therefore the NO is reduced.

If the emissions would be classified as a medium to large polluter, unless there is a mechanical failure with the engine that needs to be fixed, the emissions will be reduced substantial. Testing has shown reductions of up to 99% for CO emissions and up to 98% HC emissions.

***NOTE:** When testing emissions pre-installation, it is important that a clean air filter is used. If the air filter is dirty, replace it. Then test emissions before installing the **Vortex Fuel Saver** system. Then install the system and drive the car around the block, not more than a mile or so, for the "after" testing.

Immediate testing: It is important that the emissions be tested almost immediately upon getting the energized fuel into the chamber which is driving about a mile. Further than that, the engine will start to go into the stabilization cleaning mode. When testing right away, the average tests will show a significant reduction in emissions. For many years, it has been common to see the testing agent think his machine was not operating correctly due to the huge reductions.

This is important: An engine with high emissions is generally clogged up from varnish and particles on injectors and carbon in the engine, particularly in the combustion cylinder and compression ring groove. If the engine starts the stabilization cleaning process with the newer, more complete burn, the emissions will go as follows:

1. The HC will drop down substantially, but then will fluctuate (and may even go up) as the engine goes through the cleaning period. Once the Stabilization Period is over, normal reduction percentages will be seen.
2. The CO will go down and stay down. On Stoichiometric charts, the CO is viewed as the first gaseous component that indicates combustion efficiency. Low CO emissions mean good combustion, and good savings.
3. Although there was not a lot of testing on NO through the years, initial reports showing a decrease indicate the increased combustion efficiency.
4. CO₂ goes down the same amount as the fuel mileage goes up, as the gas puts out more energy going further with less combustion and therefore less CO₂.

In the inverse, reports of substantial fuel saving means substantial reductions of toxic emissions which are good for everyone.

Mileage testing, unless already known, mileage should be averaged over two tanks of gas before installation. Make sure that the tank is filled to full each time marking the miles between tanks and the gallons to fill the tank each time. Simply top off the last tank and divide the miles by the gallons purchased to get the MPG.

After installation, it is necessary to see what the MPG is after the third tank as that is when the Stabilization Period is generally complete. It is important to note that there will be an increase in mileage right after installation. Depending on the age and condition of the engine and the driving habits of the owner, the mileage will vary as it comes on. For example, if there is a lot of highway mileage driven, the Stabilization Period will be shorter as the engine cleans out faster on the highway. If the car is only driven around town, it takes longer - the full three tanks of gas.

Normal Results

Right after installation, Vortex customers talk about the increase in power and how smooth the engine runs. Then later, they talk very enthusiastically about the fuel savings.

Dynamometer tests have shown increases of 4-6% in Horsepower from the additional energy put out by the energized fuel.

Always remember to inform customers to try using regular octane instead of using high octane. Once they try it, they always remark it gives the same performance and now they are saving on every gallon at the pump.

Helpful hints

Many customers are astounded at the immediate results and want to sell the systems. It is always wise to get a written testimonial from everyone who will write one. Please submit a copy of this to Vortex and it will come back as useful written information for your sales.

It is helpful for the increased combustion to make sure fresh oil is in the engine. Because of that, it is necessary to get an oil change and maintain a new air filter to see the true results.

Some of our Sales Representatives send their customers a post card three weeks later reminding them to get an oil change. And don't forget to ask for referrals. You could also arrange to get them a discount coupon at a local oil change center.

If the installation is done in a facility with an air hose, it is always good to make sure the tires are inflated properly.

Vortex Fuel Saver Performance / Maintenance Tips / Troubleshooting Section

The ***Vortex Fuel Saver*** system works quietly and is permanently powered to give your customer's engine increased mileage and power, and reduced emissions. If they experience little or no change, please review these simple maintenance tips:

1. Installation: The first culprit - check with mechanic that the ***Vortex Fuel Saver*** is on the incoming fuel line as shown – we have seen it placed on the return line by a dealership mechanic.

2. Air Filter: **Optimized fuel REQUIRES A CLEAN AIR FILTER.** If dirty – replace it. If engine performance goes down after a period of time, it is an indication that the filter is dirty and must be replaced.
3. Engine Oil: Vortex performance requires good, clean oil. If dirty, change the oil and filter.
4. Sometimes, when everything has been checked such as the proper fuel line, a clean air filter, etc., it may be necessary to remove the negative lead on the battery to reset the computer. Although very unusual, sometime the computer gets stuck and will not read the new fuel/air ratio information. Simply remove the lead for 30 seconds, then replace. It is important – if there is a radio code required to restart the radio, make sure to have it ready.
5. Oxygen Sensor Replacement on gasoline engines: On cars with higher mileage, the Sensor may need to be replaced (at manufacturer's suggested interval). A mal-functioning (saturated) sensor will not adjust the air/fuel mixture required for proper **Vortex Fuel Saver** performance.
6. Temperature Fluctuations - if the temperature fluctuates or rises higher than normal after installation of Vortex Cooling Optimizer, it will be required to have the cooling system flushed. Please see Installation sheet.

Savings will vary depending on the vehicle's mileage, condition and your driving habits

INSTALLATION/USE QUESTIONS:

Is a Vortex Fuel Saver easy to install? Yes, there are no moving parts and no tools are required for installation. The system is easily secured to the fuel line, water hose and air intake with the fasteners included with a **Vortex Fuel Saver**.

However, many people have trouble finding the fuel line, or the correct place on the fuel line, to install a **Vortex Fuel Saver**. Vortex strongly recommends having a certified mechanic install the system.

Why do I need to install a new air filter when installing a Vortex Fuel Saver? Proper air flow is crucial to the performance of the **Vortex Fuel Saver**. A dirty, or clogged, air filter reduces the amount of air available, preventing complete combustion of the fuel.

Do I need to do anything else after installing a Vortex Fuel Saver? After the Stabilization Period of two to four full tanks of gas, it is highly recommended you change your oil due to the **Vortex Fuel Saver's** ability to clean the carbon and varnish build up in your engine causing the oil to become dirty. After this oil change, you will be able to go for a longer period of time/more miles between oil changes, typically 1.5 to 2 times longer than before installing a **Vortex Fuel Saver**.

When will I see results? In most cars/light trucks there will be a measurable reduction in emissions and an increase in horsepower after the first mile or two of driving. The MPG will also start to increase which can be seen on many vehicles that have dashboard displays of

MPG or Miles to Empty. The stabilization period for the average automobile/light truck is two to four tanks of gas -- the smaller the engine the less time it takes for the engine to acquire an electromotive force from a **Vortex Fuel Saver**.

Will a **Vortex Fuel Saver** work on fuel injection engines, carburetor engines, air cooled engines or hybrid cars? Yes to all.

The **Vortex Fuel Saver** works by affecting the fuel, not the engine (though it does remove the unburned fuel from the engine), so it works on various types of engines and fuel delivery systems. It should be noted, however, that the **Vortex Fuel Saver** is a complete system enabling it to do so, unlike many of our pseudo-competitors whose products only work on carburetor engines.

Will a **Vortex Fuel Saver** disrupt my car's computer system? No, the essence of the **Vortex Fuel Saver** system is focusing power in one direction and negating it in the other. Putting two pieces of the system facing each other you can literally feel the power, however, putting two pieces of the system back to back you will notice there is no effect as the power is contained by a back plate. Furthermore, the car's computer is usually located inside the car, not in the engine, providing plenty of distance between the computer and a **Vortex Fuel Saver**.