



TECHNICAL DOCUMENTATION – XFACTOR PLASMA BOOSTER - IGNITION ENHANCER v2.1

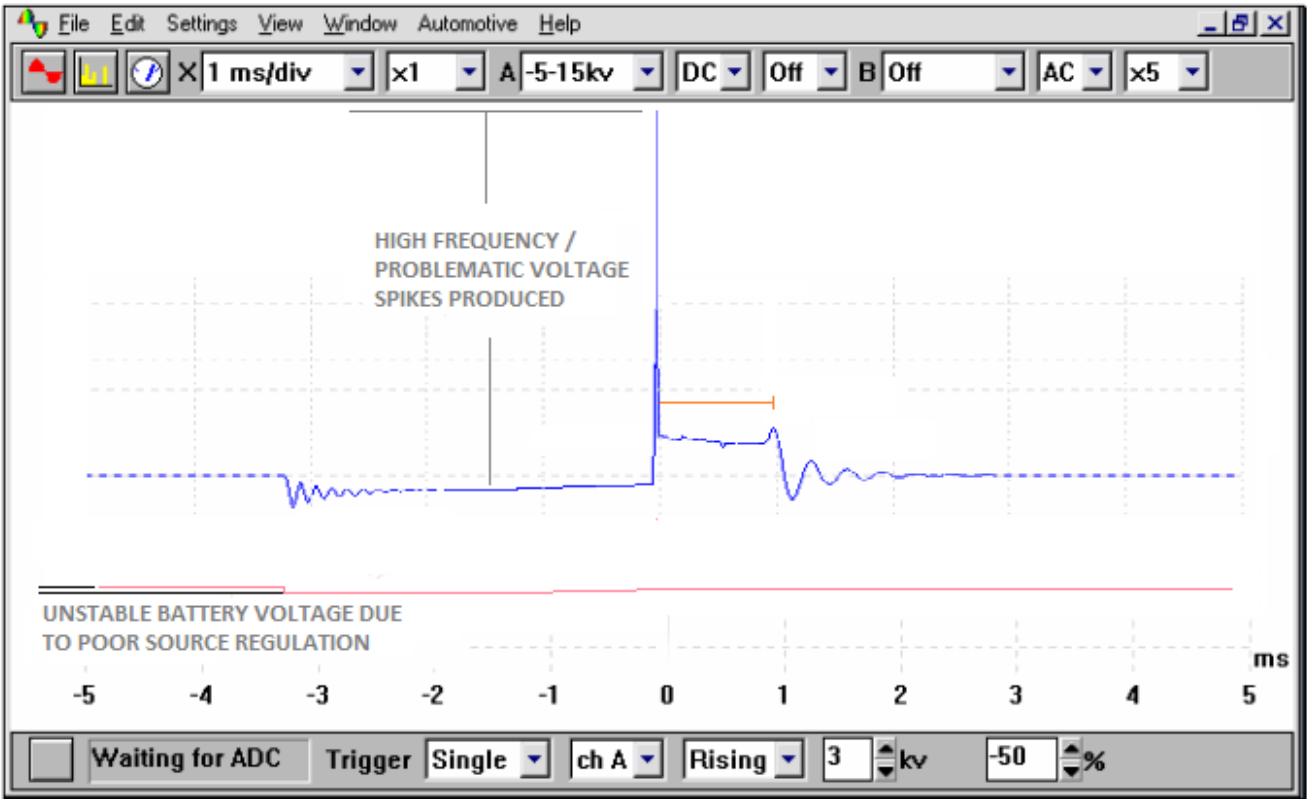
The XFACTOR Plasma Booster is a high power amplifier which drastically boosts ignition coil current at the spark gap which creates a faster burn leading to more horsepower and Torque.

Along with the Plasma Boosting effect the XFACTOR also raises voltage to the ignition coil for higher output spark events and also includes several features which protect and recover energy in the ignition system.

Common electrical subsystems all rely on the quality of the electrical signal and the stability of the voltage provided to the system. As with all electronics it is impossible to receive maximum performance (in our case spark output) if the voltage at the ignition coil input is fluctuating and prone to noise (noise being unwanted voltages in the DC circuit).

Typically when a heavy load (loads are connected to the battery and cause voltage drops) such as an ignition system are hooked up a small battery voltage drop occurs. This results in an overall loss of energy to the connected device in question.

FIGURE A



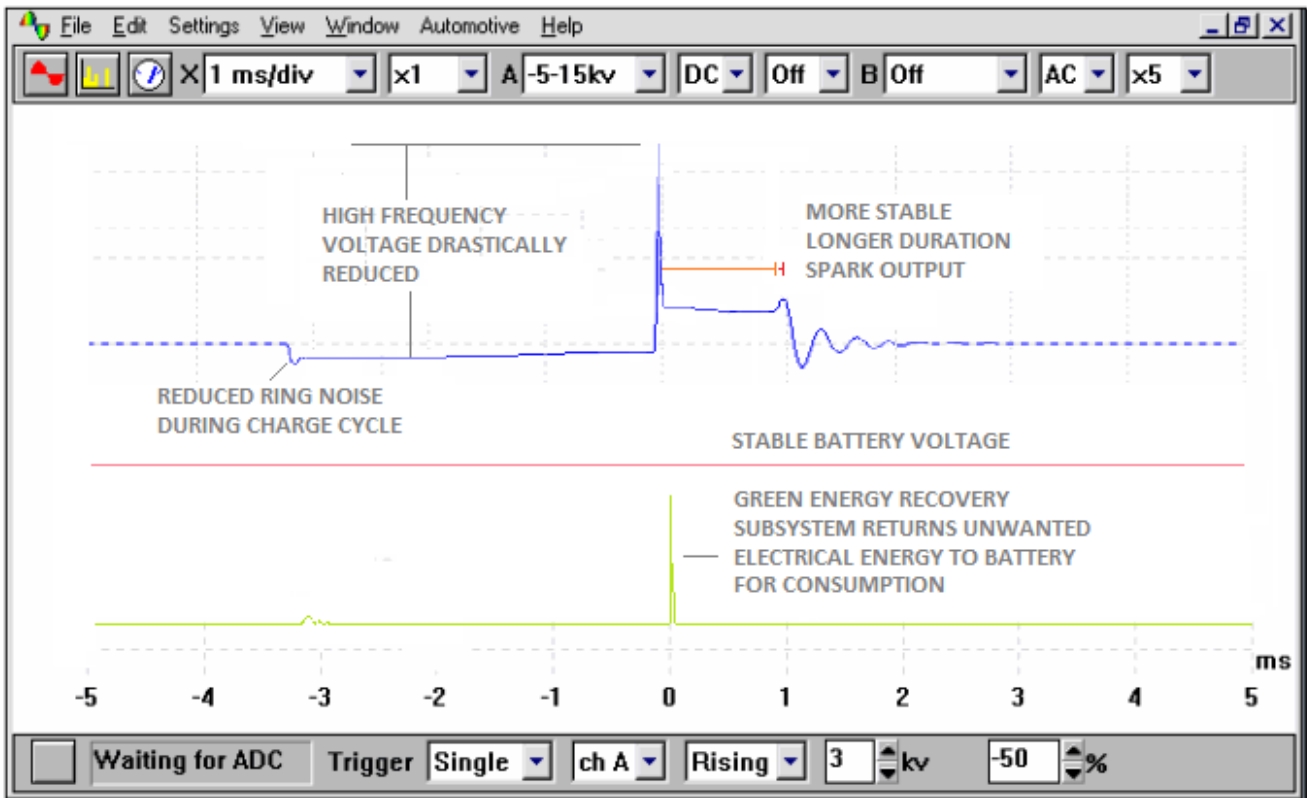
- IGNITION COIL OUTPUT
- IGNITION SYSTEM INPUT VOLTAGE
- X-FACTOR GREEN RECOVERY SYSTEM

In the following, we have an ignition coil sparking (blue trace) which is read at the input to the ignition coil. This input voltage is also found at the ignition system / ecu electronics. While the ignition coil is being powered up we can see a drop in input power at the battery to the ignition coils identified by the red / black traces. When charging in a time frame of 1 millisecond this voltage then starts to become a fairly significant loss in input power on the ignition coils. What is also identified is the poor regulation capabilities of the systems input power due to this drop in battery voltage. This is primarily due to the high resistance of the battery / alternator and poor performance providing instantaneous power to all sub systems. As a side effect

it also produces ringing / oscillation in the circuit which is commonly known as interference energy. It should also be known that while the ignition coil discharges the high voltage it creates, it also tends to also “push” and overcome the input energy and pushes these energies back into the input system. These transient high voltage and oscillating energies are not handled well by the electronic systems and is commonly referred to as high frequency EMI or RFI interferences.

These interference spikes happen every time the ignition coil fires off. A single ignition coil can fire off as many as 800 times a second in typical waste spark applications, on a V8 multiply this interference energy by 8 for a total of 6400 times a second. This becomes a significant point of power loss since these high voltage spikes are lost as interference energy and are also the source of common electronic issues. This is due to the attached electronic subsystems having issues identifying these voltage spikes causing poor or erratic electronic performance. Since the ignition is connected to the engine management system it potentially also causes an issue with erratic engine performance.

XFACTOR Ignition Enhancer – Performance, and Ignition Enhancement.
Figure B



With the XFACTOR connected, Figure B, we can now see that the input power trace (red line) is regulating much better and within millivolts of it's steady state voltage. The change isn't even recognizable at the same oscilloscope settings used to read the input energy in Figure A. This does a variety of things.

BETTER ENGINE PERFORMANCE

Since the input power on the ignition coil is much more stable it allows for a higher voltage to be applied to the coil during it's charge cycle allowing for a hotter output spark. Typical systems rely on mechanical energy process and a large battery with a potentially high ESR. This has 2 drawbacks. The first being that the battery or the alternator (mechanical energy supply) cannot supply the energy to the ignition system fast enough to provide stable ignition performance. The WeaponX XFACTOR has very low ESR capacitors allowing for extremely fast discharge rates. This allows the capacitors to supply high bursts of electricity

when the rest of the electrical system cannot meaning your ignition system gets all the energy it needs at all times.

STABLE IGNITION COIL INPUT VOLTAGE

With higher input voltage it also means higher output voltage. The more energy we can supply to the ignition coils the hotter the resulting output spark will be. As demonstrated by the orange measure line, the XFACTOR converted it's stored electrical energy into a hotter / longer spark event. Since we convert more of our input energy into spark energy the added spark energy also improves overall engine efficiency.

REDUCED EMI and RFI ENERGY

In ALL modern day vehicles what is required is clean power to and from all devices. Erratic energy and voltage signals are a significant source of electronic issues. The XFACTOR Ignition Enhancer provides this enhancement to one of the noisiest electrical environments produced in the vehicle, the ignition system.

As noted, the red trace shows battery power into the ignition coils which is now being regulated at a steady state. The primary ignition coil input energy is also dramatically enhanced. The internal circuitry of the XFACTOR effectively analysis the input power and then determines if the power in the system is meant to be within the system or not. If the XFACTOR determines that the input power is not proper for the system it effectively analysis the input stream, and dumps interference energy back into the battery while providing a stable voltage to all connected electronics.

Notice that all transient high voltage spikes are eliminated, ringing and oscillations in the system are dramatically reduced. Since all these transient voltage spikes and electronic interference is pulled from the system by the XFACTOR Ignition Enhancer it allows for all connected electrical subsystems to work much more seamlessly ensuring reliable engine management and flawless performance!

GREEN ENERGY RENEWAL SYSTEM

EMI and RFI energy is just that, wasted energy as useless interference. Why would we demand more energy from the battery and alternator when this useless energy can be harnessed and converted back into useful energy? The answer is WeaponX's renewable energy sub-system! It is well documented that interference energy is a result of the ignition coil producing energy that overcomes the input energy and effectively "pushes" this energy back into the electronic systems placed into a vehicle. All that interference energy is typically lost or wasted through alternate means but the WeaponX XFACTOR takes advantage of this lost energy, (produced in excess of 6400 times a second!) and re-introduces it into the charge system as useful energy.

The XFACTOR simply and effectively takes these harmful energies and restores them back into the primary voltage source of the vehicle, the battery, much like a hybrid does with it's braking system. This also means that this is energy that the alternator does not have to re-supply to the vehicle. 6400 times a second the XFACTOR is renewing the energy of your battery for free. This also means improved electrical efficiency and reduced engine load on the alternator! Go green and save fuel, save energy and produce more engine power!

XFACTOR PLASMA BOOSTER

Among other performance benefits seen with the XFACTOR it also successfully boosts ignition coil current allowing for hotter and more efficient spark events.

XFACTOR SPECIFICATIONS

- All circuit components are designed with at least 150% (cdi equipped vehicles) to 400% tolerance (rated at least 2.5 times their applied current or voltage). Who says electronics can't last?
- 2 X, 1000V, 165°C, low impedance, low ESR, reservoir capacitors.
- 2 X High frequency noise suppression circuits that eliminates high voltage transients.
- 2 X voltage analysis circuits with ultra fast electronic response time for determining voltage rise signals ensuring stable voltage output and reliable operation.

- Precise voltage control and green energy recovery sub system allows for energy renewal and greater electrical system efficiency.
- Plasma Boost circuit which increases available ignition coil current.
- Ultra low impedance and inductance, solder reinforced traces to maximize frequency response and noise absorption. Lower impedance means more noise is converted into power!

Technical Specifications

Power rating	: 120W (max)
Input voltage	: DC 6V-1000V
Current consumption	: 15mA @ 12V; 8mA @ 24V
Chassis	: extruded aluminum with black epoxy finish
Fuse	: None
Capacitor type	: high ripple current, low-ESR, 165 degrees C, 1000V, custom spec capacitors.
Electronics	: Fast sampling / reaction solid state components.
PCB	: Low ESR, low resistance / impedance traces / solder points.
Protection	Thermal overload Fail-safe, Short Circuit Failure mode Fail-safe*
Connections	: Pass through plug and play design.
Grounds	: X2, one for electronics and one for Green Drain System

*During Fail safe modes pcm will trigger misfire on cylinder connected to the XFACTOR.