

THE EXTRA MILE

Engine Building and Power Techniques

BY SCOTT SEHR



Absolutely, The Most Motor For Your Money! *Guaranteed*

Sehr Performance
going the
“EXTRA MILE”

It's So Easy With EFI

With the cost of some of the self-learning electronic fuel injection (EFI) systems coming down, it is becoming a more attractive alternative to fuel today's hot rod engine. These systems use electronic sensors to read all necessary engine signals to correctly fuel the engine. Carburetors use a mechanical signal to operate and thus they are more forgiving when things are not just perfectly right. However they do not always properly fuel the engine throughout the whole RPM range and because of this, power and torque at particular areas of the RPM range can suffer. This is one of the attractive benefits of EFI, along with better starting capabilities and broader and smoother torque and power curves. The EFI companies advertise an easy, quick and smooth installation, but if certain things are not taken care of the EFI systems will not work well. There are several things we have run into on our engine dyno with these systems and I thought I would share some of them so hopefully it can help make your installation trouble-free.

One of the first things of importance is the electrical system. Since all of the EFI components are electrical, a proper and smooth power supply is very important. If the electrical supply is below the needed voltage, then all systems will be slow and the computer reading the information will reach the learning map late and will learn this at an inaccurate rate. If the power supply is irregular, then it only compounds this problem. Another thing to be aware of is electrical wave scatter within the engine bay. There are more wires in an EFI system and if they are crossing or touching ignition or other wiring this can disrupt and alter the signal to the learning ECU. Having adequate protection will protect against this; we have also experienced a leaking ignition system where the electronic impulse scatter interrupted the system.

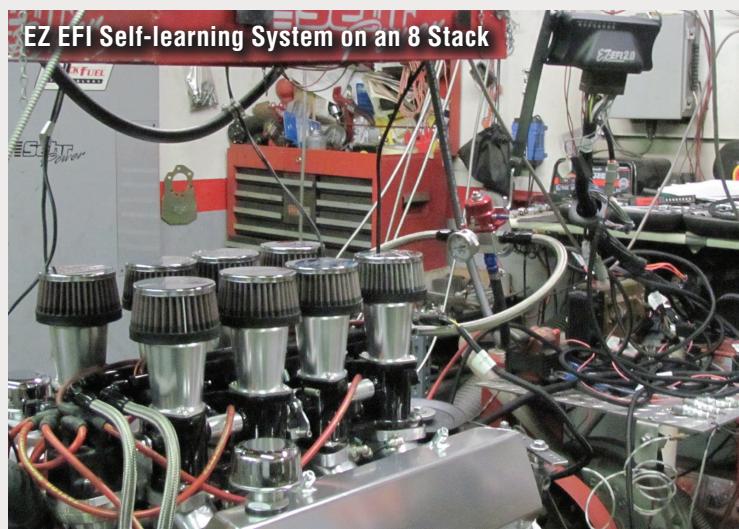
Another critical but often overlooked system on an EFI is the exhaust system. The ECU takes the reading of the oxygen sensor to correctly fuel the engine. The more oxygen in the exhaust mixture the leaner the ECU thinks it is, and

then it enriches the fuel mixture. The O2 reading happens constantly and the ECU is continuously adjusting the fuel curve and at the same time learning the needs and characteristics of the engine so it can often pre-think the actual needs of the engine. If there is any form of exhaust leak, this will suck in cold air and give the oxygen sensor a false lean reading. It will continuously enrich the fuel mixture and the ECU will learn this at the same time so you end up with a very rich burning engine. If a large more aggressive camshaft is being used then the reversion in the exhaust system is quite great at idle and in the lower RPM range so fresh air can be reversed into the header and affect the O2 reading and again enrichen up the fuel curve. A fully sealed exhaust system is essential to combat this phenomenon.

There are many different things that will affect the way your engine runs and having some guidance is one of the ways we go the “**Whole Extra Mile**” for our customer no matter what it takes.



MSD Atomic System



EZ EFI Self-learning System on an 8 Stack