

Linder Technical Services

# Networking Newsletter



**December 2006**

## A Year in Review

WOW another year is over! This marks our 15th year in business and I just reviewed my business plan from 1991. Things sure have changed since then. Our team has grown into 6 full-time and 2 part-time workers not including myself. A big change since Peggy and I were once here alone! I feel that every now and then you just need to sit down and review the past and look at the route you have taken over the years. I read once that "You can never manage the past, only learn from it" and I believe that is very true!

Our core business, "Fuel Injector Service", has grown and we have added new part numbers to the service each and every week. For 2007 we plan on adding even more parts and creating a new Throttle Body Fuel Injection Performance department. Have a TBI vehicle and want more flow and overall performance? Give us a call and we will put you and your vehicle in our "performance test group".

So what's in store for 2007?

- € Our one week "Guru School is offered four times next year with many seats being sold out already.
- € Guru II is scheduled for Feb 9-11 and is filling up as well.
- € Training and orientation for new sales reps will be on May 22. For more information on our Field Sales Rep. Program, visit our website at: [www.lindertech.com](http://www.lindertech.com). From the homepage, click on the "opportunities" link.
- € Our annual weekend technician training conference is scheduled for Sept. 7-9

Looking at the planner for next year we will be doing off site seminars in 8 states and our second 3-day seminar in Canada. Our Canadian conference is in conjunction with Canadian Technician Magazine and Cochrane Automotive. More info available on our web site at [www.lindertech.com](http://www.lindertech.com).

Future newsletters will include articles on our Bonneville trip which is set for September 10-16, 2007. We plan on engine dyno runs before end of January. Our new HA/GR (honky ass gas rail ) dragster will be shown at the February "World of Wheels" car show here in Indy and then it will be raced at the "Goodguys" show at O'Reilly Raceway Park in Indy in June and the H.A.M.B. nationals in Joplin, MO in August. The build is chronicled on the Jalopy Journal website. I am known as GMC Bubba on the site. It's an interesting read and you'll find some "Bubba humor" mixed in as well. For more, go to: <http://www.jalopyjournal.com/forum/showthread.php?t=149308>

We are presently re-doing the training center side of the shop for a new look and have found stuff we didn't even know we had. The change is already noticeable and by the time our September conference rolls around, many of you might not recognize the place.

More next month.

—Jim Linder

## Analysis From the “Sleuth”, Michele



This month’s case study is on a 1999 Chevy Suburban with a 5.7L engine and just over 100K miles on the odometer. The customer complains that the Check Engine light is on and he has a misfire that is more noticeable at idle.

A quick test drive confirmed the MIL was on and the truck had a definite misfire. Next, a scan with the Tech2 showed the following codes:

P0300: Random Misfire

P0135: O2 Sensor Heater Performance, Bank 1 Sensor 1

P0161: O2 Sensor Heater Performance, Bank 2 Sensor 2

Just by looking at the code descriptions, I could quickly determine that I had more than one problem. It was clear to me that the O2 Heater performance codes were not causing the truck to misfire. Obviously further testing was required, but it was a good time to stop and call the customer. I thought he should know that it was going to take more than one thing to completely “heal” the truck. After a quick phone call, I could better qualify the customer as to how much money and time he was willing to spend to fix the truck. As I had guessed, he was mostly concerned about the misfire. That gave me a direction.

I decided to concentrate on finding the cause of the misfire. Since the code stored did not identify a specific cylinder, I started the truck and looked at the “misfire graph” on the Tech2. It seemed that cylinder #1 was the only one showing a misfire. The next step was to do an injector balance test. To do that, I needed to hook up a fuel pressure gauge and found that the fuel pressure (KOEO) was 63psi. That is within spec. Now I was ready to perform the injector balance test with the Tech2 which really made things easy. Basically all I had to do was turn the key on and wait for the fuel pressure to stabilize on the gauge. It would initially go up to 63, but then bleed down to 57psi and hold steady. (I wasn’t too concerned at this point “why” the pressure bled off a little bit. I haven’t ever seen a Chevy truck hold steady pressure without a little bleed off, have you? :) Next, I energized cyl #1 injector with the Tech 2 and watched for the fuel pressure to drop. I saw no change on the gauge. I repeated the process for the remaining 7 injectors and had a consistent 7psi drop on all except the first one (cyl #1). At that point, I was fairly certain that the injector on cyl. #1 was the problem and a new CSFI unit would fix the misfire.

Since it didn’t take much time to diagnose the bad CSFI unit, I took a few minutes to look at the code descriptions and flow charts for the O2 Sensor Heater Performance codes. After at least 1/2 hr of the key being “off”, the first step is to monitor the HO2S voltage for the 1st 2 minutes after turning KOEO. Voltage should increase or decrease by 150mV in 2 minutes. Then you’re instructed to basically check fuses, check for power to the heater as well as confirm a good ground. After waiting 1/2 hr., I turned the key on to look at the sensor values. After 2 minutes there was almost no change in the voltages. I then checked the fuses and found they were all good. Since we don’t have a lift in our service bay, I was reluctant to crawl underneath the truck to check powers and grounds, especially knowing that the customer might not want to spend a lot of money on this truck.

It was time for a 2nd call to the customer. I informed him that a new CSFI unit needed to be installed in order to correct the misfire. Then I explained to him that the heater circuits on the B1S1 and B2S2 O2 sensors were not working properly and further testing (resulting in more diagnostic \$\$) would be required to determine the exact problem, but I thought it might just be 2 faulty sensors. Then came the tricky part. I explained that simply replacing the CSFI unit would cure the misfire, but the check engine light would

## THE “WIZARD” TAKES A ROAD TRIP

I did something last month that was long overdue. I took a trip back to my hometown, Connersville, IN and did a Fuel Injection presentation at the local Career Center. Actually, I did two presentations for approximately eighty students in total.

My audience was juniors and seniors from six area high schools. I talked about the history of fuel injection, types of systems, system maintenance and some diagnosis. The BIG hit was passing around the injector cutaways and explaining the parts of the injectors and how they worked. I also used our FUELISH TIPS DVD to show some actual testing being done.

A couple of students had cars that were diagnosed with injector problems. Upon my return to the Injector Lab I sent them a set of injectors to ease their pain. They had a Chevy Blazer in their shop with a 4.3L that I used to help explain a CSFI system as well as an intake off of a Ford 4.6L that make a good visual aid showing how intakes and throttle bodies get carbon in them. I was impressed that it took about twenty minutes of each class to answer questions.

Here is a program that is NATEF certified; in a facility that is as clean as it was the day it opened and has an extremely qualified instructor, Mr. Brad Bever. Brad’s pride for the program could be seen in his students. They showed a lot of respect for him by giving me their undivided attention. One of the discussions I had with Brad was support for the program. He was so thankful to have a guest instructor for the day that it may me think,” *What if all of us spent a little time in a High School Auto Shop?*” We always talk about needing GOOD technicians but are we doing anything to help develop them!



## Analysis from the “Sleuth”, (Cont. from page 2)

come back on due to the problem with the O2 Sensor heater problems. I had prices for only replacing the CSFI unit as well as prices for replacing the CSFI unit with further diagnostic time for the heater performance codes and prices for 2 new O2 sensors. As I assumed, the customer opted to only replace the CSFI unit. I once again reiterated the fact that the misfire would be gone, but the check engine light would come back on until the O2 Sensor problems were dealt with. After our conversation, I immediately made a note on the work order that the customer was aware that the check engine would come back on after my repairs until the problem with the O2’s were addressed. Normally I am very hesitant to do what I call a “partial” repair because even though customers say they understand, they really don’t. That’s perfectly evident when they return the next week complaining that their check engine light came back on. I know you are all way too familiar with what I’m talking about. Not only do you have the added irritation of a “comeback”, but I am uncomfortable sending a vehicle out of my shop with the check engine light on (or knowing it will come back on) because it tends to diminish the importance of the light in the customer’s eyes now that they know they can actually drive with it on and “nothing major will happen”. In this case, I felt the customer was honest with me and understood exactly what I was saying.

*Conclusion on back page* →

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## Analysis (Cont. from pg. 3)

I went ahead and replaced the CSFI unit with one of the new style CSFI units that has mini-injectors at the end of each line instead of the poppet nozzles like the O.E. design. We have published several articles on this unit over the past several years. For more information, refer to our past newsletter articles from February 2000, March 2001 and February 2004. These past newsletters can be downloaded from our website by going to: [www.lindertech.com](http://www.lindertech.com) and then clicking on the "latest newsletter" link. Also note the pictures below. The picture on the left is the O.E. design and the picture on the right is the new-style design w/ mini-injectors.

A test drive confirmed the truck was running great. When the customer arrived to pick up the truck, we went over our phone conversation again and I had him sign the work order next to the notes that I had made regarding the O2 sensor codes and the check engine light.

Wouldn't you know, the very next week he called me.....just to say the truck was running great, the check engine light came back on as I said to would and he would be back in a month or so to have it checked out. Oh, then he thanked me for doing a good job!

