

## LTS “Summer Series” Training

At long last, we finally have details on our up-coming “Summer Series” of training classes to be held here at our shop on Gasoline Alley. Listed below are class dates, instructors & bios, class topics and class descriptions. **To register, please call Susan at: 317-487-9460 or toll free at: 888-809-3835.** These classes will be limited to the first 24 students to register, so don’t wait! Prices (per technician) are as follows:

Single Class, \$275

2 Classes \$500

Buy all 3 classes for: \$700

**\*\*Special Offer: Purchase all 3 classes PLUS the annual LTS Conference for only \$899!**

### June 27: Ford Overview

**Class Description:** This 8-hour class will include: How to read Ford wiring diagrams, How to follow pin-point tests and not get fooled, How to use Ford OBDII operation model year summaries, Maintenance and Engine repair “must know” information that most Ford dealership techs don’t even know, Electronic analysis procedures for automatic transmissions, an overview of the CVT, an overview of the Escape Hybrid, Air Suspension and Active-Trac and if time permits, some general Ford Diesel information will be discussed.

**Taught By:** Mark DeKoster is an Assistant Professor at Ferris State University in the Automotive Service Program. Mark is L1 and Master ASE certified. Prior to coming to Ferris University in 2004, he was a Service Training Instructor for Ford Motor Company and has also been a trainer for Snap-On. His field experience includes several years as a team leader in a Toyota store as well as time spent as a Service Director for a multi-line GM store.



### July 25: GM Update

**Class Description:** These systems for GM powertrain have rolled out in the last few years: GMLAN (CAN) Data Bus, Throttle By Wire Systems, GM’s Exhaust Cam Phasing, Displacement On Demand (DOD), Compression Sensed Ignition, Flat Response Knock Sensors, Regulated Voltage Control (RVC), E-85 Alternative Fuel Vehicles, Electro-Viscous Controlled Fan Clutches, Resistance Calculated Oxygen Sensor Heater, Temperature (RCOHT). Are you ready for them to roll into your shop?

**Taught By:** Dave Hobbs is a 30-year ASE certified veteran of the automotive world and has spoken for OEM’s, ASA, MACS Worldwide and Automotive Video, as well as being a past speaker at the Annual Linder Technical Services Technician Conference.



### August 29: Chrysler Update

**Class Description:** Details on this class are still being put together, but this 8-hour day will concentrate on what’s new in Chrysler Powertrain and Body Controls as well as information on the latest in suspension, air bag and A/C Diagnosis. While the independent shop may not have seen some of these newer systems, it will give the technician an idea of what’s coming to their service bay in the very near future.

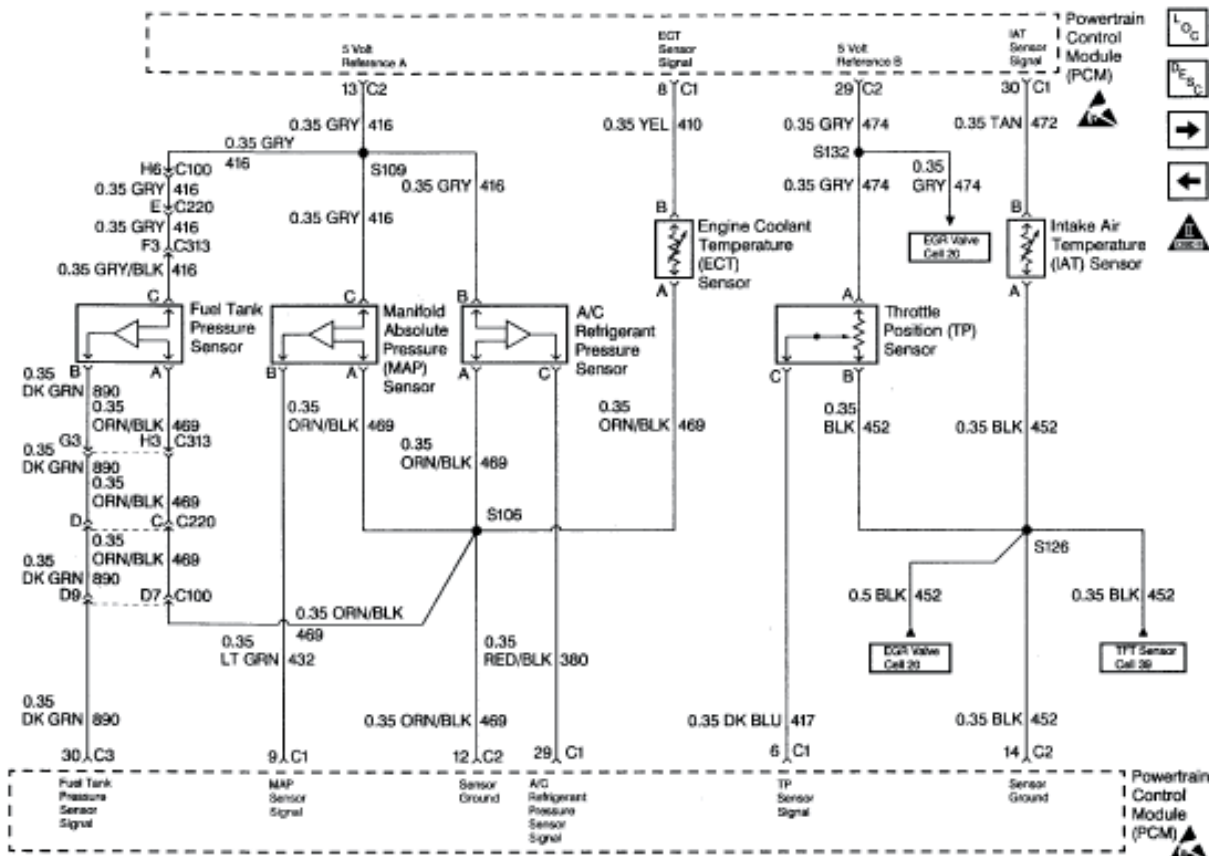
**Taught By:** Currently, this class will be taught by Jim Linder and Doug Garriott with the possibility of a manufacturer rep joining us for part of the day.

# Analysis from the “Sleuth”, Michele Winn



I had no idea how many people actually read our newsletters until I left this case study unfinished last month. I have been getting 3-5 e-mails every day since the last newsletter asking me to tell them what the “fix” was for this car. So, here we go.....

When we left off last month, I was working on a 1996 Pontiac Sunfire that runs rich, idles rough and stalls. Through a TSB search on Motoralldata.com, I found a recall about corrosion in the PCM connectors, so I was just about to take all the connectors off, pull the PCM out, retrieve the service# and call the local parts store to order one. As I pulled on the 2nd connector, I noticed that something was moving. The PCM seemed loose? Another tug confirmed that PCM wasn't loose, it was still firmly mounted, but the box that the PCM was mounted to was loose. As I peered through the right front wheel well, I could see that the EVAP canister shared the same mounting box and it appeared that all the bolts holding the box to the frame of the car were broken or missing. In fact, the only thing holding the PCM and the EVAP canister inside the car were the hoses connected to the top of the canister! What a mess! Without a lift, this wasn't something I wanted to try to repair. I decided to take a break for a few minutes, looked over my notes from everything I had tested so far and decide what I wanted to do. My list of problems was mounting: 1. Known bad #1 injector. 2. Corrosion in PCM connectors and possibly PCM 3. Problem with mounting bracket for PCM & EVAP canister. 4. Scan data readings that just don't make sense. Remember when I unplugged the ECT, my MAP voltage went to 0 and kpa dropped from 77 to 10. I looked back at my strange scan data readings. I didn't understand why the MAP voltage was effected by unplugging the ECT. As it turns out, I printed a wiring diagram for the car earlier while I was searching for TSB's. (Courtesy of MotorAlldata.com) After finding the recall regarding the corrosion in PCM, I got side-tracked and never went back to look at the diagram to see if I could find a relationship between the ECT and MAP sensor readings. Now seemed like the perfect time to take a look at the wiring diagram.



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

It didn't make sense to me that unplugging the ECT sensor would make me lose my MAP sensor 5 Volt reference. Maybe it was a ground problem or problem at the splice (S106) and the MAP sensor was getting its ground from the ECT? I was confused. I decided to get back underneath the car and look at the connectors again. With all the PCM connectors disconnected and dangling down, I could see that the black convoluted loom and electrical tape was missing in several places on the wiring harness. Judging from the buildup of dirt and grime, it seemed like the wires had been exposed for a long time. As I stripped back the remaining loom and tape and separated the wires, I found 2 wires that had been rubbed almost completely through! One was a gray wire (all that was left was the insulation) and the other was an orange wire w/ black tracer. I could only see one strand of wire left inside of that one. (See picture to the right) Looking back at my wiring diagram, it turns out that the sensor ground for ECT and MAP sensors was orange w/ black tracer and the 5V reference wire for the MAP sensor was gray. Could it be?! I went to tell Doug what I had found. He volunteered to solder in some new wires for me. You know how certain people enjoy doing certain things? Well, soldering is not one of my favorite tasks. Especially not when I'm laying on my back and the hot solder is running down into my arm pit. I gladly accepted his offer. Of course, as a good friend, I kept him company while he was working and took another good look at the rest of the wires. I noticed one more wire that looked suspicious. The insulation was still intact, but it had been bent at such a severe angle that it looked like the wires inside might be broken in half. (See picture to the right) I'm sure you've seen wires like this before. Even when you try to straighten the wire out, it still has a bulge where the bend used to be. I decided since Doug was already soldering, it would be a good idea to repair that wire as well, just in case. Turns out it was the signal wire for the Crank Sensor, so I'm glad he took care of it. Before reconnecting the PCM, I cleaned all 3 connectors (per the recall service procedure).



Even with the wiring repairs complete, I still wasn't sure if that would fix the problem. I decided to simply check KOEO data again to see if there had been a change. Sure enough, you'll see by the readings below that everything appeared to be back to normal.

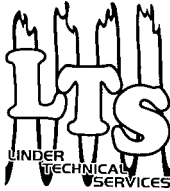
	<b>Before Repair</b>	<b>W/ ECT Unplugged</b>	<b>After Repair</b>
ECT	7 degrees	-40 degrees	80 degrees
IAT	95 degrees	93 degrees	78 degrees
MAP	77 kpa	10kpa	99kpa
MAP	3.54V	0.0 V	4.99 V

Just because the scan data was “fixed”, it still didn't mean the car was fixed. It wouldn't be the first time I chased a problem trying to “fix” the scan data readings, only to find it made no difference in the actual problem. With spark plugs cleaned, ECT plugged in and injectors re-connected, I hit the key. It started without a hitch and idled great! Of course, there are still a few issues with this car, but it's hard to justify the expense of replacing fuel injectors when the customer won't notice any improvement in driveability at this point. The same goes for the dangling PCM / EVAP canister mounting box. It wasn't something I could fix without a lift, but still hard to convince someone they need to go somewhere and spend more money to have something fixed when they won't notice any improvement in driveability. So, I did what most of you do: I wrote a laundry-list of things that still needed to be fixed on the bottom of the invoice, had the customer sign it and collected my money. We don't always have to return the vehicle back to brand-new condition, sometimes it's OK to return it to “good enough” condition :)

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## 30-G Bubbas Trailer Park and Hot Rod Shop

### 1<sup>st</sup> Quarter report

The first 90 days have gone by faster than I had expected. Most of you reading this newsletter remember that I rented some more space the first of the year and cleaned out a few of my storage sheds. We now have three sections at the 30G location. The grey side (referring to floor paint) is set up as a work shop with tools, saws, lathe, grinders and a portable lift. The green section (middle) is the trailer park show room complete with a small diner (featuring hot dogs and moon-pies) and room for 4-5 teardrop trailers to be on display. The end section is storage with the storage shed contents and 3-4 vehicles stored for the winter.

January started out with a bang with the sale of two trailers as well as some pretty strong ebay sales from the parts shelf. If you remember, my goal was not only have a hobby area but to make a profit as well.

February brought more trailer orders with a couple of complete trailer kits out the door. Now I really need to hustle as my trailer stock has gone down a bunch and I have about 30-40 days to finish another trailer for delivery on May 1<sup>st</sup>. Along with the trailers, we have almost completed a '57 VW Rat Rod and a 1920 Model T Ford truck. The '57 VW will be for sale this summer and the T Truck will do service as a touring vehicle as the warmer weather gets here. Both were built out of spare parts I had stored over the years.

I also just received two orders for aluminum single seat Model T Speedster bodies and looks like we will gear up and get these made sometime this summer. Maybe the only 2 we ever make, but the project looked like we could get it done and I agreed to get them built. May go ahead and build 3 with a show room piece for us to use as a marketing tool. We have had traffic of a few hundred visitors to the show room (thus the increased sales) and wish to make "Bubbas" another unique business.

—Jim (Bubba) Linder