

Linder Technical Services

Networking Newsletter



March 2007

GURU-II February 9-11, 2007

This year's Guru-II class was a huge success with 27 students attending from 13 different states as well as 3 who attended from Canada! With the completion of this class, a total of 148 students have been through the weekend Guru-II class since its inception in 2000.

Prior to the class, we had a LOT of snow and I think the guys who traveled from California were surprised to see so much white stuff! One asked that I e-mail a picture back to his shop so he could prove to the guys back at work what "horrible conditions he had been thru!"



The class began Friday afternoon with John Thornton's Ford Coil On Plug class. In the past, we have only had time to cover primary and secondary ignition during the week-long Guru schools, so the Coil On Plug class was a natural choice for Guru-II. John taught until dinner, after which Jim took over with an Electronic Service Information and NASTF update. Class ended around 7pm and everyone loaded onto the LTS busses and headed out for the evening's entertainment. The annual World of Wheels Car Show was in town for the weekend, so we spent a few hours checking out all the cars. Jim had 6 of his hot rods entered in a separate building called, "Motorama" with nothing but hot rods. Everyone was back at the hotel around 10pm so they could be rested for Saturday's classes.



"Motorama" with nothing but

Saturday morning started with Jim's Graphical Scan Tool class which is an overview of most O.E. and generic scanners and their graphing capabilities. After a short break, Randy Dillman took over with a class about European scan tools. The class was an overview of what scan tools are available, what they cost and where you can purchase them. It was great for those who don't work on many European cars because with this knowledge they can decide what types of repairs they want to do and what equipment they will need.



After lunch, everyone was split into small groups (5 or less) and headed into the shop for some live scanner demonstrations. This year the following tools were represented: Tech-2, Ford IDS/PDS, Snap-On Modis, Vag-Com and Chrysler StarScan.



Continued on back page →

Fuel Injection Service From the “Wizard”, Doug Garriott



How well do you understand the function of the Fuel Pressure Regulator?

I was recently ask to explain the following question from a test: “On an engine with an idle vacuum of 19”HG and a fuel line pressure operating within specification at 35psi, the PCM (Powertrain Control Module) assumes fuel pressure at the injector tip to be: 25psi, 35psi, 45psi or 54psi (The correct answer is 45psi.) I couldn’t give a good explanation as to how the answer was derived. So I did some digging.

The first thing I did was refresh my memory on pressures. I found goggle to be quite helpful with this. The only problem was one definition led me to another, which led me another and so on. Let me summarize.

Absolute Pressure – The force exerted by the system on unit area of its boundaries. It is measured relative to the absolute zero pressure – the pressure that would occur at absolute vacuum.

Absolute Vacuum – A volume that contains no matter, also called a perfect vacuum. Which is not obtainable. (A little more then 30” hg on a gauge).

Barometric (Atmospheric) Pressure – The pressure around and within us so we don’t feel it, but engines do. When the in take in air it reduces the absolute pressure below atmospheric (vacuum).

One thing I had to get out of my mind was “Gauge Pressures”. We are so use to seeing all pressure readings base on the gauge that we are using. Take vacuum, it has always been expressed as a negative pressure. That is because our gauges use atmospheric pressure as a baseline (zero) and what we read was less then atmospheric pressure. A fuel pressure gauge reads positive (above) atmospheric pressure. Now think about an absolute pressure gauge. They are sealed, referenced to zero pressure. With the engine off it would read absolute atmospheric pressure and would always read positive whether below atmospheric (idle) or above atmospheric (boost). Sounds like a MAP sensor to me. I remembered that Ford had some charts regarding pressure relationships, so to the Ford manual I went. I found what I was looking for, sort of. What I had to do was think metric and do some calculating. As can be seen from the chart, Kilopascals (kPa) is used for absolute pressure.

Here is the way I figured it using the chart. If you take the 343.53 kPaa that 35 psig fuel pressure equals and you subtract the 36.96 kPaa that the intake pressure equals, you get a **Differential Pressure** of 306.57 kPaa. When you divide the 306.57 kPaa differential pressure by 6.92 kPaa (what 1 psig equals) you get 44.31 psi relative pressure, close enough for me!

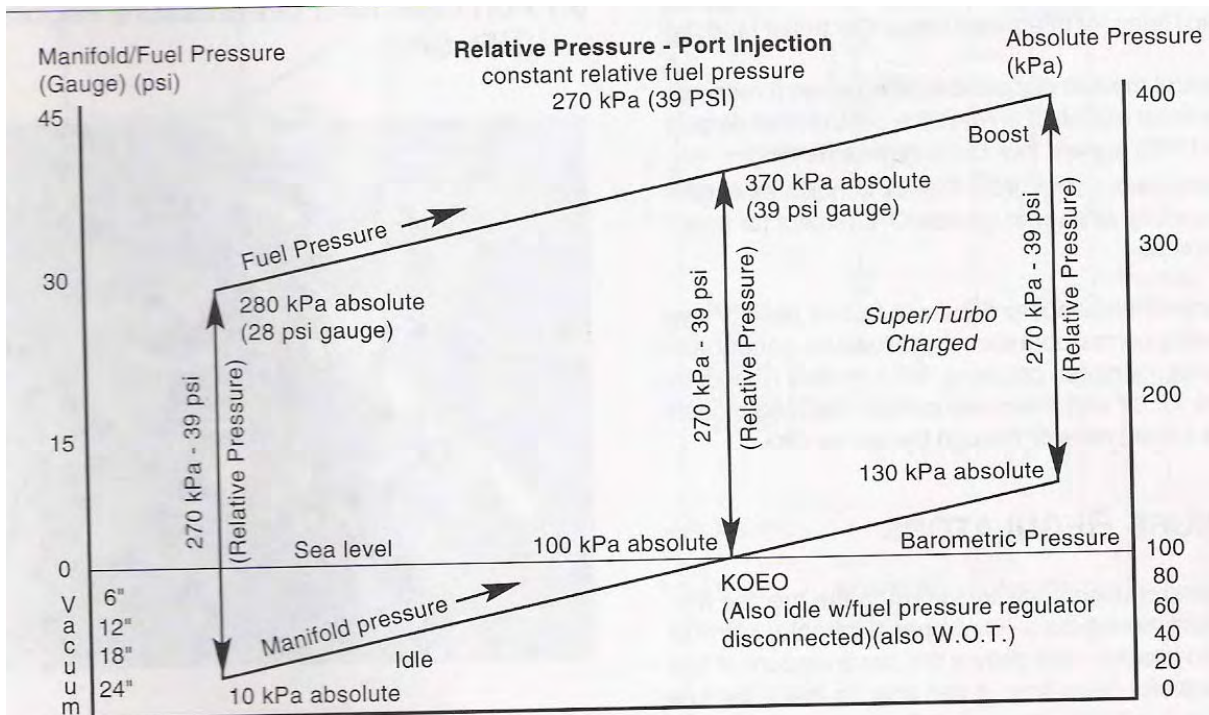
PRESSURE RELATIONSHIP

Pounds Per Square Inch Gauge and Inches of Mercury Gauge	Kilopascals Absolute
35 psig	343.53 kPaa
30 psig	308.93 kPaa
20 psig	239.73 kPaa
10 psig	170.28 kPaa
1 psig	108.25 kPaa
0 psig / in Hg	101.33 kPaa
1 in Hg	97.94 kPaa
7 in Hg	77.63 kPaa
12 in Hg	60.68 kPaa
19 in Hg	36.96 kPaa
29.92 in Hg	0.00 kPaa

Continued on next page →

From the “Wizard” (Cont. from page 2)

So why did I title this “How well do you understand the function of the Fuel Pressure Regulator”? To maintain precise fuel metering, the fuel pressure regulator maintains a constant pressure differential across the injectors. Meaning the pressure in the rail will always be a constant value above manifold absolute pressure. This way the computer knows an injector will deliver the same amount of fuel for the same pulse width under any driving condition. As a result of this kind of regulation of relative fuel pressure, port fuel delivery per injection is not affected by changes in manifold absolute pressure. (See chart below)



LTS “Networking” Conference 2007

Our annual technician training conference and trade show is coming up on Sept. 7-9, 2007. There will be a cookout and open house at our shop on Thursday evening (Sept. 6) and classes will begin at 1:00pm on Friday and conclude on Sunday at noon. As usual, hospitality rooms will be open at the hotels each evening after classes and trade show closes. Wayne Colonna will be back again this year with a short update on his transmission “insights” class which he has taught the past two years. Returning after a break last year will be Randy Dillman who will be our European influence for the weekend with Volvo and BMW training. We also have confirmed a class on GM Body Controls by our “mystery instructor”. We are finalizing plans with several other instructors to bring you another non-stop weekend of current, real-world training.

As always, seating is limited, so look for your registration forms to start arriving in the mail during the later part of April. Over 50 people pre-registered before leaving the conference last year, so don't wait!

Linder Technical Services

**4-D Gasoline Alley
Indianapolis, IN 46222**

**Phone: (317) 487-9460
Fax: (317) 487-1868
Toll Free: (888) 809-FUEL**

www.lindertech.com

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Guru-II (Cont. from front page)

The small groups were headed by an instructor who highlighted the graphing capabilities of the tool as well as many other features, talked about pricing and where the tools could be purchased. Special thanks to Matt Fanslow, John Thornton, Scot Manna, Randy Dillman and Tom Freels for doing such a great job with the demonstrations!

Saturday evening's dinner was the usual "Bubba-style cookout" and as you can see from the picture, it looks like everyone had plenty to eat and really enjoyed themselves. After dinner, Scot Manna took over teaching a class called "Interactive Arsenal Diagnostics". He really got the class involved by having discussions about what type of diagnostic paths they would choose for certain problems, how they would charge the customer and what resources are available to technicians when facing the problem of "How do I charge for diagnostic time". Many eyes were opened that night and I'm sure changes have been made in a few shops.



Sunday morning's class was taught by Tom Freels of Sinclair College in Dayton, OH. The morning was "all about Chrysler's" featuring many things on the new models that those in the independent world may not have seen yet, but it's coming soon! Sunday's class wrapped up around noon and after a brief thank you and goodbye, the guys were on their way home.

Thanks to all those who attended and made this such a great class! Pictures will be posted on our website soon. Next year's Guru-3 class will be held on February 8, 9 & 10, 2008, so for those who have already completed Guru-II, we hope to see you then!