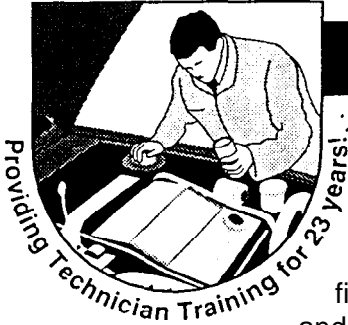


# Networking

The Official Newsletter of LINDER TECHNICAL



## TECH TRAINING

### FLATRATER PUZZLE PALACE ???

The following fix comes to us from a new web page operated by our ole friend Jim Wilson on the left coast. Jim's web page includes different repairs and puzzles (with fix supplied later) regarding complex late model vehicles and is a MUST read for all and any technicians working today! You can visit this informative web page and get the fix for this broken vehicle at: <http://www.primenet.com/~iwilson4>

Here in California, Chevrolet is warranting truck poppet nozzle injectors for 10 years or 100,000 miles. If the injectors are stuck closed, we are to replace them. If they work their way open after being closed, we are to only service them with Techron fuel additive. Now you might ask, "how are you supposed to know if they were previously stuck closed?" Good question, Chevrolet has yet, to my knowledge, answered that one... I will usually watch when the P030x code set, how many misfire counts are in history, and if the engine breaks down under load. With that in mind, lets move on to the case study...

A 1997 Full size Chevrolet truck shows up in my stall with an illuminated MIL. There are 79,000 miles on the clock and it is idling slightly rough. Watching the misfire graphic screen on the Tech 2, I could see an occasional increment of the misfire counter for #2 cylinder. That is not characteristic of a stuck closed poppet nozzle injector where you would have a steady incrementing of the misfire counter(s). Raising the engine speed and loading the engine down did not produce any secondary misfiring; the engine actually smoothed right out; more confirmation that the injector is not stuck closed...

Now lets take a look at the stored code(s). There is a freeze frame and the accompanying failure record.

#### First the Freeze Frame

P0161 Freeze Frame Data	
Engine Speed	1671 RPM
ECT	127 °F
MAP	65 kPa
Short Term FT Bank 1	-3 %
Short Term FT Bank 1	124 Counts
Long Term FT Bank 1	0 %
Long Term FT Bank 1	129 Counts
Short Term FT Bank 2	-2 %
Short Term FT Bank 2	125 Counts

Tech 2

P0161 Freeze Frame Data	
Long Term FT Bank 1	124 Counts
Short Term FT Bank 2	-2 %
Short Term FT Bank 2	125 Counts
Long Term FT Bank 2	0 %
Long Term FT Bank 2	128 Counts
Loop Status	Open Loop
Engine Load	24 %
MAP	48.00 g/s
Vehicle Speed	41 mph

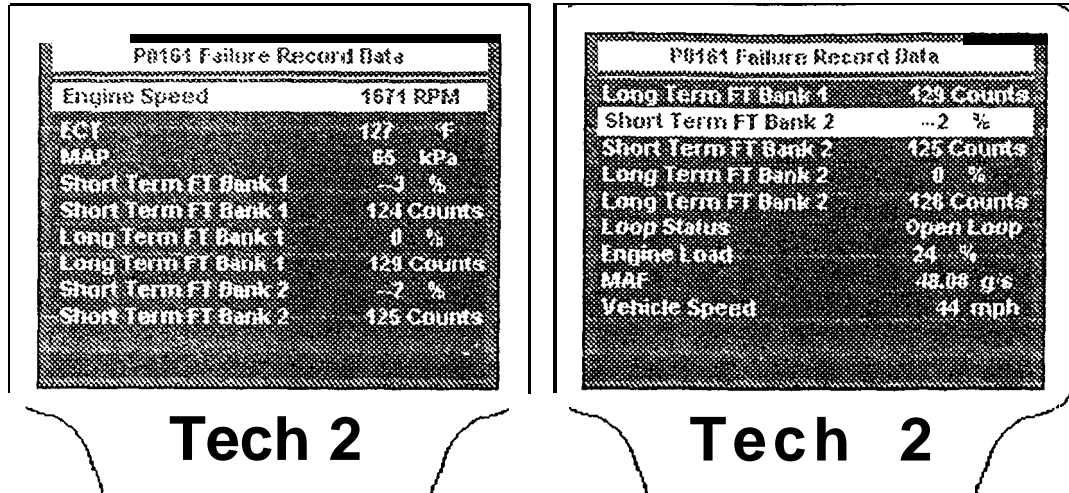
Tech 2

# FLATRATER PUZZLE PALACE ???

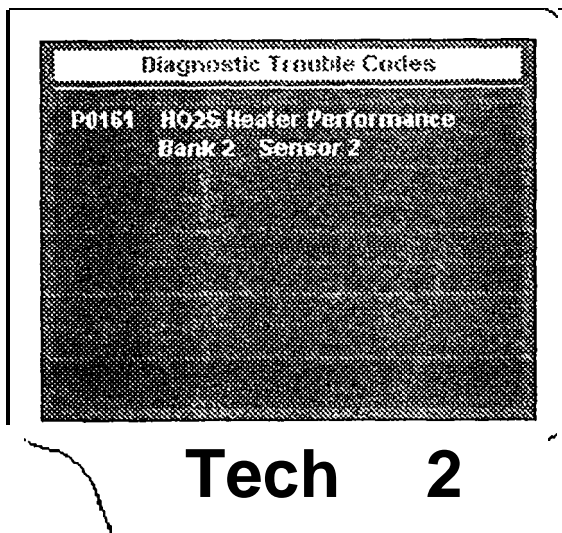
(Continued from page 1)

This is the complete list with some overlap. With the exception of some soft key commands, this is what I saw on the screen. Now lets look at the Failure Record and see if has been updated. As most know, Freeze Frames cannot be updated but Failure Records can be.

## The Failure Record



As you can see, the data is exactly the same as the Freeze Frame. This means that the diagnostic has not failed since the failure that set the Freeze Frame and illuminated the MIL. This does not mean that the problem is gone however; the test may not have been run since the failure that set the MIL. Now lets press a soft key and see what that code is for...



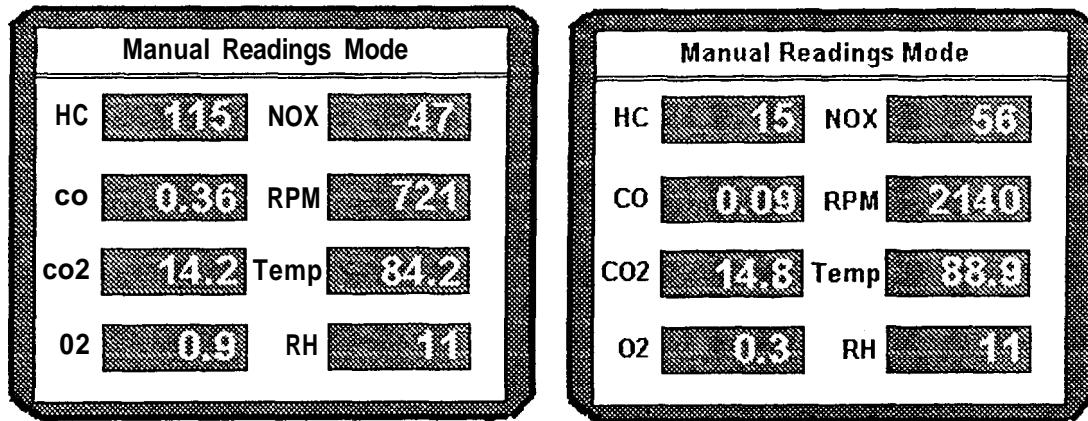
Interesting no? I let the engine cool down for 10 minutes and tested the O2 heaters by leaving the key on with the engine off. All 4 O2 sensors started out at 450mv and were below 175mv within 3 minutes. Oxygen sensor heater circuits are tested upon cold startups while watching for sensor activity. Chevrolet trucks do not currently monitor the actual current. They are tested while monitoring "time to activity" or TTA.

This Oxygen sensor looks ok. Could it be inoperative at times? Sure, but I don't think that is the case. I think it's tied into the rough running for some reason. With the Tech 2 and a fuel pressure gauge, I ran a quick injector flow test. All the injectors appeared to flow about the same. Although this is obviously NOT a scientific test, experience so far has shown that it is more than adequate. Now before we stuff a gas analyzer up the

tail pipe, I want to mention another truck I had earlier with a post cat O2 sensor setting intermittent heater DTCs. I had ran multiple heater tests and allowed the truck to run its own onboard tests twice, yet after replacing the O2 sensor, it returned with an illuminated MIL and the same heater failure code. The "fix" was supplied by Chevrolet technical assistance; a redundant sensor heater ground. Or in other words, oops! We screwed up and have a design flaw (I had no excessive voltage drops). With that said, I don't think that this is the case for this truck. Lets look at the tailpipe emissions since my smog machine is only a few feet away and warmed up.

# FLATRATER PUZZLE PALACE ???

(Continued from page 2)



There are NO vacuum leaks... What do you think the fix for the rough idle was, and would you believe that it took care of the P0161? Note, I am not going to defend the logic of the onboard diagnostics for this one....

Fix is supplied at : <http://www.primenet.com/~jwilson4> and our next newsletter for those not internet ready at this time.

Jim Linder  
The injector "guru"

## TECH TIP

*From the Guru*



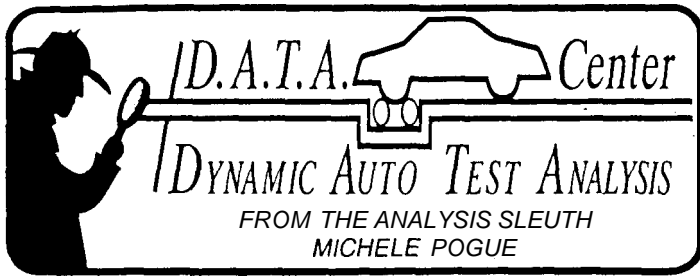
GM TRUCK 1996 -98 CHEVROLET And GMC S/T, M/L, C/K, G, P Models and 1996-98 Oldsmobile Bravada with 4.3L, 5.0L, 5.7L engines. VINs W, X, M & R

**PROBLEM WITH ROUGH IDLE AFTER START WHEN VEHICLE HAS SAT OVERNIGHT / SCPI POPPETS STICKING (CLEAN FUEL INJECTOR USING NEW PROCEDURE)**

**CAUSE:** Deposit build up on the ball-to-seat interface may cause a poppet valve to stick closed, therefore depriving that particular cylinder of fuel. This condition usually will only effect one poppet at a time, and it is not uncommon for the poppet to free itself and resume normal operation. It is also believed that some fuels may also adversely affect poppet performance.

**REPAIR:** Perform injector Balance Diagnostics with tech 2 scan tool per TSB # 87-65-07 and repair as needed.

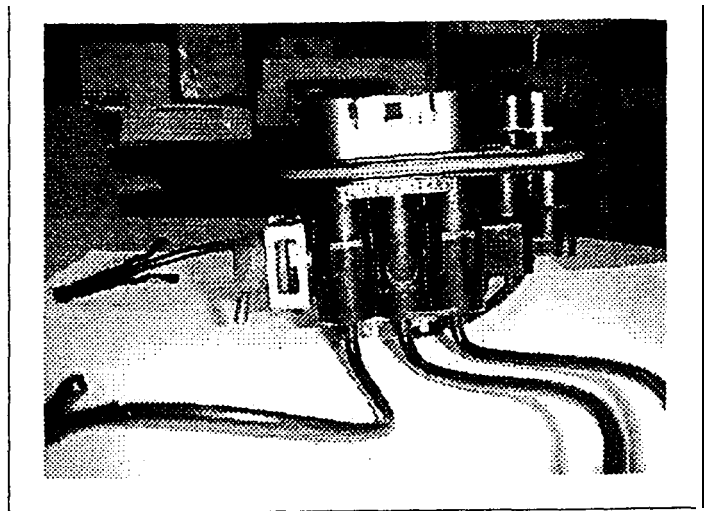
**NOTE!** LTS can now service these units, off and on vehicle!



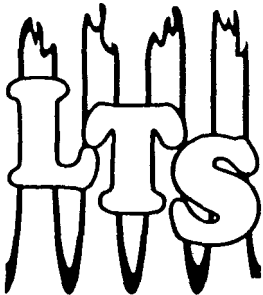
Many of you have become very familiar with the CPI unit used on the GM Vot-tec V-6 engine from 31-95. These units have been updated for 1996 and are slightly different. The new units are called CSFI (Central Sequential Fuel Injection). These new units still resemble the old CPI units, but their operation is much different. You may see these in 6 or 8 cylinder varieties. These "pods" contain not one, but six (or eight) injectors and a fuel pressure regulator, all of which can be replaced separately without replacing the entire assembly.

The fuel injectors fire sequentially which makes proper installation of the tubes critical.

I had a call on the hotline a few weeks ago from a technician that had installed one of these CSFI units in a truck and wanted to know if the tubes had to go back in the same spot. The answer is a definite YES! On the old CPI unit, it wouldn't have made any difference because all of the cylinders were getting fuel at the same time, but on a sequential system, the tubes must be in the proper order.



For those of you wondering, on the side of the "pod" each one is labeled. Fuel pressure on these new systems is slightly higher, 60 – 66 psi with pump running and engine off. Sticking poppets also seem to be a problem with these systems. GM has an on the car cleaner designed to free sticking poppets. I recently heard from a technician at a GM dealer that he had to run the system up to 80psi before he had any luck with the cleaner. We have just recently started seeing these systems in our fuel injection room. As more and more go through the system, we will have more detailed information on testing and repairing these CSFI systems.



4-D GASOLINE ALLEY  
 INDIANAPOLIS, IN 46222  
 317-487-9460 OFFICE  
 317-487-1 868 FAX

WEB PAGE: [WWW.LINDERTECH.COM](http://WWW.LINDERTECH.COM)  
 E-MAIL: [LINDERTECH@JUNO.COM](mailto:LINDERTECH@JUNO.COM)

**We're on the web!**  
**[WWW.LINDERTECH.COM](http://WWW.LINDERTECH.COM)**

WE ENCOURAGE  
 PROFESSIONALISM



THROUGH TECHNICIAN  
 CERTIFICATION



DECEMBER 1999