LINDER TECHNICAL SERVICES

Networking

Newsletter

MAY 2002

More valuable E.S.I. Information!

Tech Training

The following story comes from the Transpo Electronics Inc. website: www.transpo.de. They manufacture voltage regulators, rectifiers, diodes, ignition modules, DC/DC converters and test equipment. On their home page, you can go to the “rebuilders forum” and view new products or read tech tips. This is where the case study below was found.

“This should be of interest to Rebuilders and shops doing Auto Electric work. Recently a rebuilder called Transpo Engineering and said they had a problem with a CS130D alternator they sold to one of their local garage customers..

The failure scenario was as follows: The customer drove the car for 3 days apparently not paying attention to the charge indicator lamp (which was on). In addition, it appears that the Rebuilder's garage customer did not perform a charging check after installing the alternator. The garage owner had a scan tool which could erase any trouble codes that were stored in the vehicles PCM. This would solve the charging issue for a short time, then the vehicle would stop charging and the indicator lamp would come back on. To make a long story short, the battery went dead. After 3 PCM's and a trip to the dealer, the vehicle owner has filed a claim against the garage owner and the Rebuilder for $1,800.00.

What Happened?

The vehicle was a 1998 Chevrolet Lumina with the 3.1 V-6 engine. Further investigation shows that this vehicle uses two possible alternators: 10463964, which has a D702 (PLIS) regulator, or 10464071, which has a D705 (PLFS) regulator (10463964 was the unit used). To further confuse the issue, this was a high mileage car that had previously had an alternator replacement and there was no I.D. number available on the casting.

The vehicle owner solved his problem by having a dealer install a Delco Reman 10464071 alternator, which uses the O.E. 9705 regulator. The O.E. 9705 and the Transpo D705 regulator are compatible with "Smart Cluster Instrument Panels" (see October 2001 Forum). The customer's vehicle had a smart cluster panel, but how could the garage owner have known? Or, how could our rebuilder customer have known (he said he could not read a number on the O. E. regulator; and it was bad). You can't tell which alternator/regulator combination is used by the vehicles wire harness because there are only (2) wires: the battery wire to the output post and the regulator wire harness lamp connection. Unless you can get some kind of resistance reading between the I/F and lamp terminal it's a guess.

Here Is Your Answer!

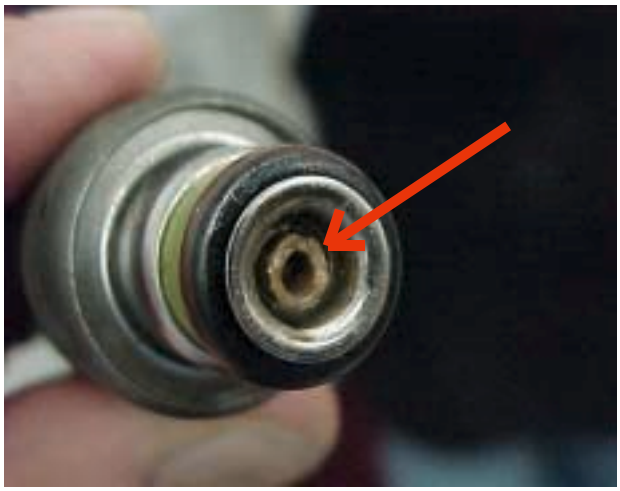
The 3.1-liter V-6 engine family is used in the following vehicles: 97-98; Buick Century, Chevrolet Lumina, Chevrolet Monte Carlo, Pontiac Grand Prix. These vehicles can have either of the (2) alternator/regulator combinations listed. The key in this situation is to look in the trunk for the accessory package tag that will have the following I.D. K68 package will use the 10464071 with the D705 and will have the "smart cluster panel". The K60 package will use the 10463964 with the D702 regulator and use a standard instrument panel.”

This is just another example of the amount of valuable information that is available thru E.S.I. (Electronic Service Information). I believe that E.S.I. will become the standard method of viewing and retrieving information in the future. Look for more on this subject in next month’s newsletter, as the entire issue will be devoted to the topic of E.S.I.

Jim Linder, The Injector “Guru”

Fuel Injection Service Update from the "Wizard", Doug Garriott

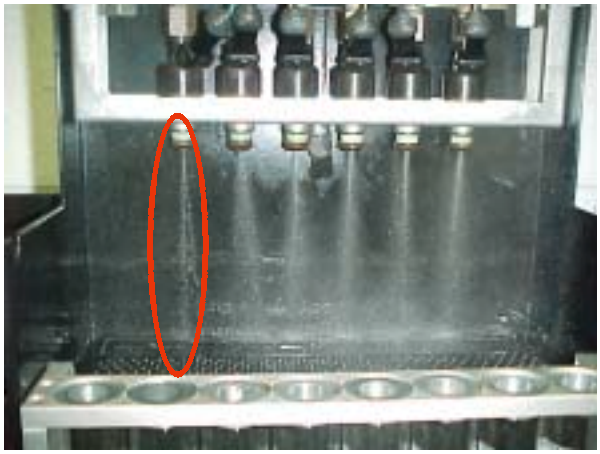
While going through injector cores, I came across a very interesting G.M. Multec injector. It was one of their "stamped spray tip" design used in the 3100 "M" engines. It appeared to have a stalagmite growing out the fuel discharge end. At first, I thought it was debris that got there after the injector was out of the engine, but further investigation revealed that it was permanently attached *(see picture 1).*



(Picture 1)

Everyone in the injector lab felt that this deposit looked like crystallized sugar. I thought I would get some pictures and do some testing while this growth was still attached. The deposit affected the flow volume from the injector (*see picture 2*) and it also narrowed the spray pattern (*see picture 3*).

(Picture 2: actual fuel volume as tested on our flow bench)



(Picture 3: spray patterns)

I contacted Richard Augustus of BG Products, and asked if he could test the deposit to find its composition. I sent the deposit off to Richard and within a few days I got the results: the deposit tested positive for being sugar. This injector now lives in "The Wizard's Injector Archives". So the next time you are in the injector lab ask me to show you the sugar injector. If you ever come across an injector that you think would make a good case study, send it off to me with a note and I might just let it live in the archives!

Analysis from the "Sleuth", Michele Winn

When we left off last month, I was working on a 1996 Ford Windstar with PO304 (cylinder #4 misfire). To my surprise, I received about 10 e-mails and 3 or 4 phone calls regarding this problem. Most already knew what the problem was but admitted having difficulty diagnosing the first one. One guy called to say that he had a vehicle just like this one in his shop and wanted to know what the fix was! I was tempted to make him wait until this month's issue, but I decided to give him the answer early :)

Ok, let's get back to work and fix this thing! I had already checked ignition, fuel pressure, vacuum leaks and was now deep into the flow chart for the PO304 code and really hadn't found anything wrong. I had stumbled upon a TSB (#98-25-5). The first thing I was instructed to do was reprogram PCM with latest calibration. I used the NGS to re-flash the computer with the newest calibration and crossed my fingers. Unfortunately, I still had the identical problem when I started the engine.

Let's take a minute and talk about programming. We go by the rule: don't flash any computer unless you are directed to do so by a TSB. BUT, just because the TSB says to flash the computer, that doesn't mean it will definitely fix the problem. It MAY fix the problem, but remember there are plenty of other things that could have caused a misfire code!

Step 2 directed me to perform several more tests:

1. ***Perform Service Bay Diagnostic System Power Balance Test.*** This is a very cool function of the NGS scan tool. It will perform a cylinder balance test on its own. It raises the engine rpm to 2000 and kills each cylinder individually. If it determines there is a weak cylinder, it will display a code for that particular cylinder. In this case, the vehicle passed with no problems.

2. ***Perform Spark Duration test.*** They want you to look at the spark line portion of the ignition pattern in a bar graph form. Many scopes may not have this function, but you could also stack them on top of each other in a raster format and check it that way.

3. ***Perform injector flow test.*** I think I already explained what I think of this test.

4. ***Perform Relative compression test.*** After duplicating the miss, immediately shut down the engine and perform this test.

5. ***Check for vacuum leaks.*** Remember, I already checked for leaks with the smoke machine.

6. Disconnect the EGR valve and try to duplicate the miss. AHA! The miss goes away with the EGR unplugged. I've found the problem……..it needs an EGR valve. Or does it? The next step says to remove the upper intake manifold and clean out the EGR passages that are plugged with soot. This is where I started thinking too much. If the EGR passages are plugged with soot, there will be NO EGR flow, therefore it shouldn't effect the misfire if I unplug the EGR valve, right? That would be a correct statement if ALL of the passages were plugged, but what if one wasn't?

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Analysis from the "Sleuth", (cont.)

All EGR flow would be diverted to the cylinder with the open passage and would cause a misfire. I spent more time over-thinking this problem than it actually took for me to remove the upper intake, clean the passages and put it back together. Thanks to Randy Dillman of LTS North for helping me get this one straightened out.

The last step in the process (according to the TSB) is to run 2 cans of Carburetor Tune Up Cleaner (or equivalent) through the engine. If the customer had done some preventative maintenance, clogged EGR ports may never have become an issue.

I chose to use the Valvoline 3-step system (part# 071). One bottle is poured in the gas tank, one is drawn into the intake through a vacuum hose and the other is used for cleaning the throttle body. Recently we did some testing on Valvoline's new fuel injection cleaning chemical and we were pleased with the results, so that's why I decided to use their product.