

Fine Tuning



Fine Tuning questions are answered by Mark Hicks, Technical Services Manager. Please send your questions to: Mark Hicks c/o Airtex Engine Management, P.O. Box 70, Fond du Lac, WI 54936-0070 or e-mail him at mhicks@airtexproducts.com. We'll send you a very nice golf shirt if your question is published. So please include your shirt size with your question.

Diagnose The Problem Win A Shirt

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We are going to do something a little different this time in the **Fine Tuning** department. We ran into a diagnostic case study you might be interested in. It involved a 2001 Chevrolet Impala with about 40,000 miles on it. The A/C fan and cruise control would intermittently stop working while the customer was driving. There seemed to be no rhyme or reason to the failure. The vehicle could be driven for days before the problem would occur.

As you know, intermittent problems like this can be extremely frustrating and time-consuming to diagnose. Here are a few tips that might help you speed the process. Listen to what the customer says, no matter how insignificant it sounds at the time. Gather as many details possible. Take the time to absorb and mentally process the information. Test drive the vehicle with the customer and try to duplicate the problem. This will give you an opportunity to explain that this diagnosis could be a time-consuming venture. Always check for TSBs.

These were the same steps we took. Darn, no TSBs were found. We then took a close look at the wiring diagram (a simplified version is shown here). Notice the A/C fan and cruise control are fed from the same ignition switch terminal. This was the first real clue. Could the ignition switch be at fault? Possible, but to be sure we still need to get the problem to occur. The ignition switch is in the dash on this vehicle, which makes access difficult. It's not a five minute steering column ignition switch replacement.

Before a road test, let's take a little closer look at the wiring diagram. Notice the A/C fan and cruise control are both fused. If both of these circuits are failing at the same time, they are probably losing current at the same time too.

We decided to backprobe the fuse leading to the A/C fan. Notice the ignition switch is fed by a single wire. Could this wire be losing current, knocking out the circuit and the customer just doesn't notice the other failures? At marker #4, you will see the PCM/BCM cluster fuse which is fed by a different terminal of the ignition switch. We also backprobed there.

We grabbed two DVOMs and went on a road test. After about twenty minutes of driving around, the fan went out and the cruise control quit. We connected the meters - one to each backprobe - and there it was. Backprobe #1 read 2.23 volts and #4 read 12.25 volts. Based on this information, we can be reasonably certain that the ignition switch is defective.

Think the problem through when access is limited. It isn't always necessary to go directly to the suspected component if the circuit is fused.

Here is my question to you: Let's say we only had one DVOM to work with. Which terminals could we have connected to and achieved the same test results? What would the DVOM read when we experienced the problem? What is this test called? Use the markers to describe the meter connections in your answer.

In the last **Counter Point**, a reader inquired about a misfire on a 2001 GMC truck, with DTCs P0300, P0420 and P0430. The catalytic converters had been replaced, along with the front O₂ sensors and most of the ignition components. The ignition system's scope pattern looked good, but the P0300 returned after repairs. Fuel pressure dropped from 61 psi to 30 psi after engine shut down. The reader asked if the drop in fuel pressure could cause the misfire. He also suspected an internal engine problem and asked for an easy way to check it.

First, the fuel pressure drop *could* cause a misfire. The running fuel pressure specification for this vehicle is 55-62 psi. When the engine is shut off and the fuel pump stops operating, the pressure should initially hold constant. Continue to monitor the pressure gauge for one minute. If the pressure has decreased by more than 10 psi, you might have a problem.

It sounds like pressure is dropping as soon as the pump stops. If there are no external leaks, look for a leak in the checkball in the tank, a leaking pressure regulator or an injector that is stuck open. To determine if fuel is leaking back to the tank, pinch the feed line. If pressure stays constant, it is leaking. If pressure continues to drop, the problem is in the injector system (including the pressure regulator).

Fuel trim was -2 to 0. If an injector on one bank had stuck open, that bank's fuel trim would be lower than the opposite bank, because the PCM would attempt to compensate for the rich mixture. The regulator also could be leaking intermittently. This might not show up in the readings.

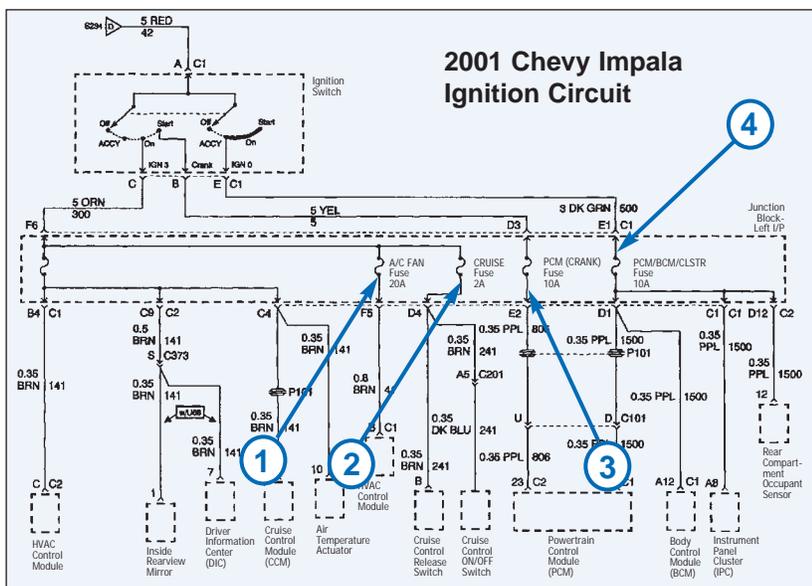
To check compression integrity, connect a vacuum gauge, then start the engine. The needle should be steady. If the needle is bouncing, there is a problem with compression, such as valves, camshaft, etc.

Results: The pressure regulator was leaking. No internal engine problems were found.

The first correct answers were submitted by:

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John Laymance
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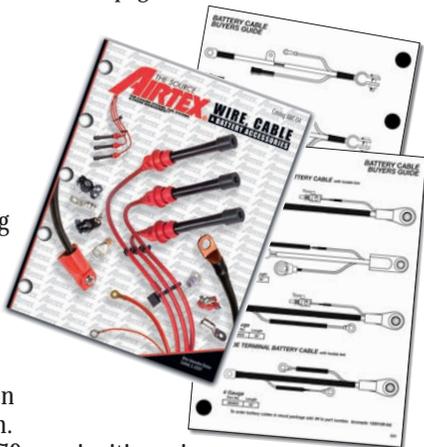
Hot off the Wire

New Catalog

Airtex Engine Management will soon release a new Wire, Cable and Battery Accessories Catalog. The catalog contains 573 pages of information and application data, with several new categories added. The new categories include Split Loom Tee Connectors, Stainless Steel Clamps, Adhesive Backed Wiring Clips and more than 100 other wire accessories.

Having trouble finding those late model ignition wire sets? We have them. In fact, we have added 79 new ignition wire sets to our already comprehensive

assortment. For the times when you need just one wire, we have added 216 single leads. We have the right lead when you need it.



Not long ago, all you needed to get the correct replacement battery cable was the length and whether it was a top or side mount. This is no longer the case. Battery cable replacement can be very difficult, which is why we have added battery cable illustrations, with specifications to make sure you get the right replacement the first time.

You can rely on Airtex Engine Management. **AIRTEX**

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