Volume 22, Issue 4

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Technicians Service Training

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Editor

"G" Jerry Truglia

"Mix Bag Of In Shop Problems"

This Honda CRV had a problem that was caused by the vehicle owner not knowing how to install a trailer light connector. Before you go diving into diagnostics, you probably feel you have a grasp of what everything in the schematics mean. You understand your tools, and have a general plan of attack, aka "Game Plan". But every so often on a wiring diagram, you'll find letters and numbers in places you don't expect them. That's what happened on this Honda. Here's how it all began. A local veterinarian wanted to add his own tow hitch, because if you work on animals, you can certainly work on your own vehicle, right?

After the vehicle owner cut up a bunch of wires in the rear of the Honda, he took apart the fusebox and put it back together.

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What is TST?

TST is a group of dedicated technicians and instructors committed to the continuing education of our fellow technicians. We provide training seminars to technicians at a reasonable price. TST brings our members nationally known instructors and state of the art training.

Our Goal & Mission Statement

- *Keep our fellow technicians up to date with the latest technology.*
- *Provide training seminars for a reasonable price.*
- *Deliver information that the technician can use now.*
- *Keep technicians informed of information affecting our industry.*
- *Increase consumer awareness of what a good technician is.*

Why join TST?

TST membership includes special pricing on weekday night seminars and the occasional full Saturday seminar. With a **$99.00 yearly individual or shop $299.00 membership, the simulcast are only $20.00. TST seminars are NOT sales or product seminars.** The instructors that TST brings in are all "hands-on" industry experts with up to date, cutting edge knowledge that you can use in your shop the next day. That's 99 dollars for a seminar in which you are able to learn something useful, for fixing those tough jobs that we all see on a regular basis. Our instructors are masters at making the complex understandable. Membership also includes a newsletter full of real world technical articles, diagnostic case studies, and solutions to the kinds of problems you see in your bays each week.

The following are some of TST's regular instructors:

Bernie Thompson of ATS
John Thornton of Autotrain Inc.
Wayne Colonna of ATSG
Jorge Menchu the "Labscope Guru," AES Wave
John Anello of Auto Tech On Wheels
Mark Warren of World Pac / Motor Magazine
Brandon Steckler of CTI & Motor Age Magazine
Peter Meier of Motor Age Magazine
Ken Zanders of Illinois Air Team
"G" Jerry Truglia of A.T.T.S. Inc.

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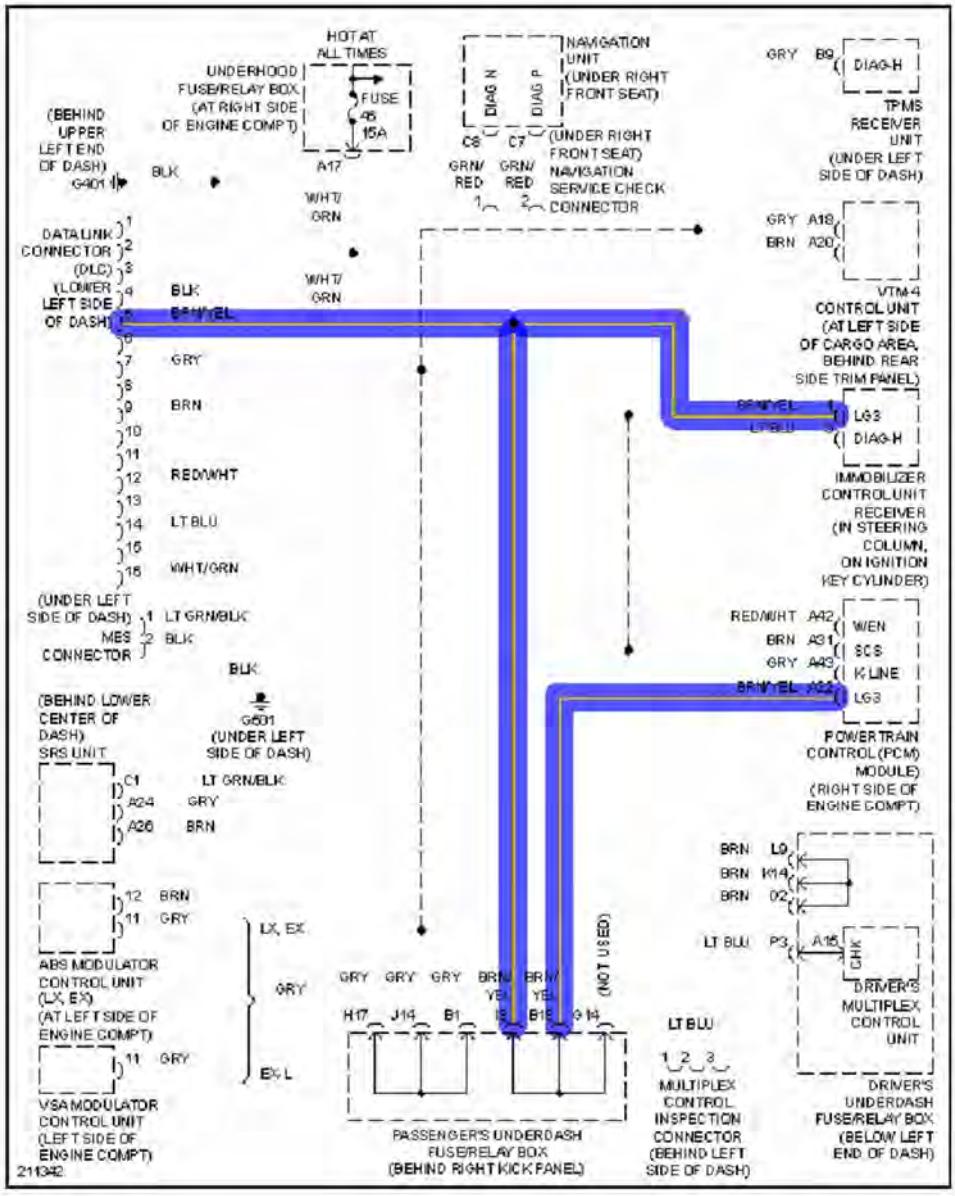
Currently there are TST chapters in Connecticut, Massachusetts, New Jersey, New York and membership continues to grow. For more information you can call TST headquarters at:

(845) 628-6928
www.TSTseminars.org

"Mix Bag Of In Shop Problems" (con't from p. 1)

The result was a burning smell, no start and inoperative windows. Realizing he was over his head, he took it to a local body shop. They replaced the body control module and fuse box, and then gave up. In addition to the original problems, now the horn would sound anytime a scan tool was connected to the Diagnostic Link Connector (DLC). This is how it ended up in our shop.



The tech in my shop is a B level tech, that is usually assigned to tires, brakes, front end and simple diagnostics. He was never given the tough vehicles to diagnosis, but now it was finally his turn. First, he knew that the customer cut some wires open in the rear of the truck for the trailer lighting. He found that the vehicle owner disconnected the brake light failure sensor and cut the wires so he could plug in a trailer harness. After testing with a Power Probe he found that the wires were not shorting the multiplexer in the passenger fuse box. Next, he decided to get the wiring schematics for the horn circuit and the computer data lines since the horn would

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"Mix Bag Of In Shop Problems" (con't from p. 4)

blow when a scan tool was connected to the DLC.

Pin No. 5 of the DLC is the signal ground for the communication network and when it was grounded the horn sounded. He confirmed this with a Power Probe, so he started with that wire and was curious to see where it led. The wire for pin No. 5 is brown with a yellow tracer and it is connected to the Immobilizer, fuse box, and Powertrain Control Module (PCM). He immediately suspected a damaged PCM (though not totally bad, it still had communication) and/or an Immobilizer issue. He opened up the PCM and noticed that it had internal burn spots. The fix was making sure that the trailer wires were connected to the correct wires for brake lights and solder and heat shrinking the wires , followed by replacing the PCM.

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5 Minute "No Start" Diagnosis

You can diagnose almost any no start in five minutes. How? Here is the five-minute plan of attack:

Engine Mechanical: Do a cranking vacuum test to see if the valves are opening and closing. For those with a scope, this test is simple and quick. All you have to do is connect the leads to the battery (positive to positive / negative to negative) and couple the scope to AC volts. Follow this by disabling the fuel and cranking the engine over. Now you are ready to perform a relative compression test. You can also perform this test with an amp clamp that goes around either negative or positive cable while the scope is set to DC volts or it's amp set up.

Fuel: Add propane to a manifold vacuum source, vacuum line, or brake booster intake hose to see if this gets the engine started.

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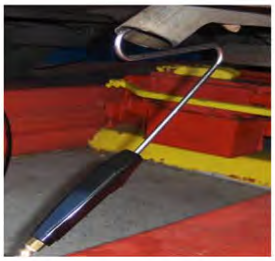
"Mix Bag Of In Shop Problems" (con't from p. 5)

If you have a gas analyzer, stick it in the tailpipe. If you read over 22,000 PPM HC (Hydrocarbons), fuel is not your issue.

Spark: Check for spark with a spark tester. If there is no spark, perform an RPM check by using the rpm Parameter Identifier (PID) on your scan tool. If you have rpm, that means you have primary ignition on most vehicles and there isn't an issue with the crank sensor.

Air

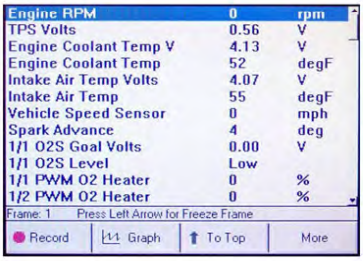


Fuel with propane or a Gas Analyzer

Good enough to start

NOT enough to start

Ignition Spark



RPM Check

Good Backpressure

S-10 Pickup Problem Brake Lights Stay On

This vehicle pulled into Bob Powell's shop with an unusual problem, the brake lights stay illuminated. Anytime the engine was running the brakes lights would come on and stay on. Turn the vehicle off the lights went off. Bob asked one of his technicians, Eric, to take a quick look at this vehcile. It should be noted that this truck was loaded with aftermarket electronics, to our dismay. Typically aftermarket alarms, remote starters, and other head-ache inducing gizmos are the first things we suspect when we see electrical problems.

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"Mix Bag Of In Shop Problems" (con't from p. 6)

Here's how we diagnosed this vehicle:

First, we questioned the customer and found out that he recently bought the truck. He told us the brake light problem was on the whole time he owned it. He was now finally ready to get the vehicle diagnosed and repaired.

After a few minutes of looking at the aftermarket electronics and trouble-shooting, Eric told me that the lights remained lit even with the brake light switch removed. Because of this, we knew that there was power from some-where being fed into the brake light feed wire, a short to power. We were fair-ly certain at this point that the problem was likely due to a circuit cross feed from one of the aftermarket electronics installations. This was a mistake, an assumption we made because of all the aftermarket accessories installed and past experiences we had come across.

At this point, I suggested disconnecting any connectors in the circuit to try to isolate the location of the fault. During this process, Eric mentioned that he noticed the lights would come on for a couple of seconds and then shut off if the key was turned on, but with the engine not started.

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"Mix Bag Of In Shop Problems" (con't from p. 11)

When he went to show me this little phenomena, it didn't happen so we didn't take this clue seriously at the time. Oh yeah, that was another mistake. In hindsight it didn't happen because other things were disconnected before he tried to show me the symptom, but we'll get to that later.

After a while I decided we needed to re-group and take another look at the wiring diagram. I pulled out my Power Probe in order to apply power to the brake light circuit at the brake light switch. What I saw surprised me. The brake lights came on, but so did the fuel pump. Now the symptom Eric experienced earlier began to make some sense and we started to examine the wiring going to the fuel tank.

It turns out that a fuel tank bracket was removed at some point and when it was replaced it pinched the rear harness, effectively connecting the fuel pump and brake light feed wires together.

We fixed the problem but the lesson here is to pay more attention to any clues you come across. Once we realized that the brake and fuel pump circuits were connected it only took a quick inspection of the frame harness to locate the fault.

Chevrolet Trailblazer Starting In Second Gear

Kevin Quinlan worked on this vehicle and diagnosed and repair the problem. Here is how he did it...He scanned the Blazer and found that it reported a transmission problem after a DIYer installed his own 1-2 shift solenoid. Of course, we assumed he screwed it up. After dropping the pan and testing the part, to our surprise the solenoid was good. We made sure it was connected properly and found that the vehicle still started out in second gear. Kevin used his most important tool that God gave him, his brain, eyes, ears nose and hands and located the problem.

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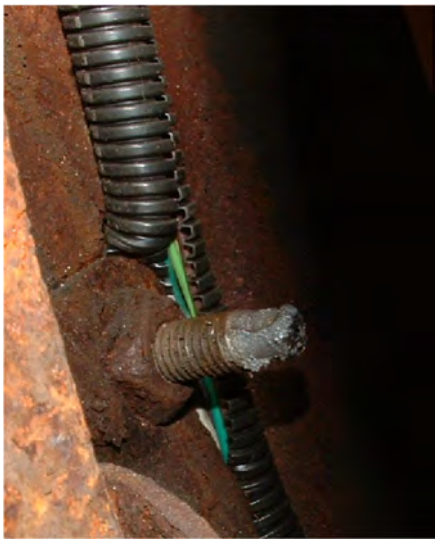
"Mix Bag Of In Shop Problems" (con't from p. 12)

Take a look at the photos to the right and you can see how we proved it out. Using a Tech 2, we commanded the still inoperative 1-2 solenoid on and off, as well as the other solenoids to see if the PCM would carry out the order. All the solenoids but the 1-2 worked when operated using the bi-directional control. However, when we applied power and ground directly to the 1-2 solenoid, it clicked. We proved that there was nothing wrong with the internal wiring itself.



It's always best to be sure before replacing any control module, and to make sure that another component wasn't the cause of the module's demise. Perhaps the old solenoid had failed besides the shorted wires caused the PCM damage. Repaired the short to ground wiring and replaced the PCM and the transmission shifted normal.

Pathfinder's Exploding Battery

This one is a simple one, but the concept is important. Nothing like a Monday morning started by a quick money maker. The customer just put in a new battery, but he says that his battery light came right back on. A quick eyeball under the hood revealed some obvious issues.

The first thing I thought was that the alternator was overcharging the battery. We used our Midtronics GR8 and it confirmed what our eyes saw. Curiously, the alternator also had relatively high AC ripple, about 200 mV (millivolts). The specification for high AC ripple is 500 mV, but that's when you test from the alternator itself.

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"Mix Bag Of In Shop Problems" (con't from p. 13)

The battery can act as a buffer, and anything in the 300-500 mV range is questionable. In my experience, a new alternator usually has 100 mV of AC ripple at the battery. Anything above 150 mV would make me very suspicious and lead me to perform a few pinpoint tests on the alternator itself. The test of the alternator with a meter revealed a different story. The voltage regulator was the issue causing the battery to overcharge. We replaced the alternator/ regulator, and battery that fixed the vehicle charging issue.

A note on batteries...make sure you realize that there are a few different type of batteries that are installed in today's vehicles.

Types of batteries:

1. Lead Acid standard battery 12.6 volts - 30k starts
2. EFB (Enhanced Flooded Battery) 12.8 - 13.0 volts - used under the hood for Start Stop vehicles 270K starts
3. AGM (Absorbent Glass Mat) 12.8 - 13.0 volts - this battery is the only one to be installed inside a vehicle including the trunk. 270k plus starts.
4. Lithium-ion 13.0 - 16.0 volts this battery can be installed in side the vehicle.

Make sure you have the correct battery charger to properly charge the the different types of batteries.