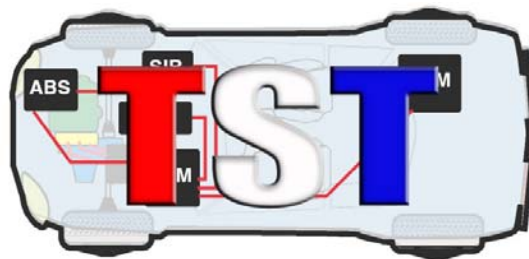


March 2015



## Technicians Service Training

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**Editor**

**"G" Jerry Truglia**

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### "EVAP Case Studies"

A Toyota Avalon (Note the Toyota Scan tool ID'd the vehicle as a Camry) with a V6 3.0L engine came in with the MIL illuminated. As we were checking for DTCs we found a P0446 (Vent Control Malfunction) that was stored. After reviewing Freeze Frame data we selected the Mode 6 section of our scan tool to view the last test results data.



We found the Mode 6 results data only passed 3 of the 4 tests.

The only failing test was the Vapor Leak # 2 that failed the minimum test.

| System                 | Monitor Status | DTC   | Curr Conf | Pass | Fail | Test Failed | Calibration        |
|------------------------|----------------|-------|-----------|------|------|-------------|--------------------|
| Engine and ECT         | Com            | P0446 | X         | X    | X    |             | 6309001<br>6309002 |
| SRS Airbag Immobilizer |                |       |           |      |      |             |                    |

**(Con't on page 2)**

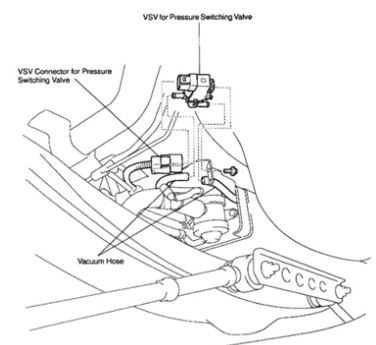
## *"EVAP Case Studies" (con't from p. 1)*

With so many different EVAP systems on vehicles we decided to look up information in Alldata on how the system and its components operate. This Toyota EVAP system has the following components, vapor pressure sensor (VPS measures

the vapor pressure in the EVAP system), Vacuum Switching Valve (VSV normally closed), canister closed valve (CCV normally

| Test          | Result | Min    | Max    | Test Value | Unit |
|---------------|--------|--------|--------|------------|------|
| VAPOR LEAK #1 | Pass   | 7.969  | 20.152 | mmHg       |      |
| VAPOR LEAK #2 | Fail   | 5.882  | 5.496  | mmHg       |      |
| PURGE VSV     | Pass   | 3.114  | 0.091  | mmHg       |      |
| EVAP PRES VSV | Pass   | 23.358 | 0.000  | mmHg       |      |

OPEN) and VSV for pressure switching valve that are used to detect abnormalities in the EVAP system. The system sets DTCs when HCs leak from the components, or when the vapor pressure sensor malfunctions. The PCM then decides whether there is an abnormality in the EVAP system based on the vapor pressure sensor signal readings. With a good understanding of the system our next step was to connect a smoke machine to check for leaks. The results of the smoke test found that the front VSV (vacuum switching valve) and the rear CCV (canister closed valve) that were both weathered and not working as designed. We installed a new front VSV along with the rear CCV that came with the complete charcoal canister and switching valves. We test drove the vehicle and rechecked Mode 6 data test results to see if it got a passing grade. The results were all passes, so we gave the vehicle back to the owner and told her to drive it for a week, then come back so we could make sure that there were no other issues. Upon her return the MIL was still out and the EVAP problem was now fixed.



*(Con't on page 4)*

## 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.*

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- *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.*

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## ***"EVAP Case Studies" (con't from p. 2)***

### Case Study #2

A 2007 Hyundai Sonata 3.0L V6 came in with a P0442 small EVAP leak DTC. This seem like it was going to be a tough one to find the leak on, since we could not find any smoke coming out anywhere on the vehicle. The Smoke Machine flow meter gauge ball was just above the limit, barely reaching the failing zone, meaning the leak was going to be small as described by the DTC. We decided that we had to use a different procedure in finding this leak so we replaced the Smoke Machine with the BullsEye leak detection tester. The BullsEye leak detection system uses CO<sub>2</sub>, a gauge that has a scale to identify a leak, a leak detector and special pink foam that turns yellow when a leak is detected (CO<sub>2</sub> is present.) As we were checking under the vehicle for leaks with the BullsEye leak detector we found that the detector indicated a leak was coming from the top of the fuel tank. Lucky for us on a Hyundai it's easy to get to the top of the tank area since they have an access cover under the rear seat. When we removed the access cover the BullsEye leak detector went off, indicating a leak at the fuel pump lock ring and gasket.



***(Con't on page 5)***

## ***"EVAP Case Studies" (con't from p. 4)***

We thought for a second that maybe we just missed the smoke coming out, so out of curiosity we reconnected the Smoke Machine to see if smoke could be seen escaping from the fuel pump locking area. With the Smoke Machine reconnected it still indicated a leak on the units flow gauge but we could not find any traces of smoke escaping. We thought that this was odd since the Smoke Machine had helped us so many times in the past, but this time it was coming up short. We reinstalled the BullysEye detector back on the vehicle and reconfirmed the leak with the leak detector unit. We followed that by spraying the special BullsEye foam on the fuel tank locking ring. It provided us proof of the leak since the pink foam turned yellow, indicating that CO<sub>2</sub> was leaking from the locking ring. Since this fuel tank is a composite type and not metal we know that the O-Ring and locking ring were most likely the only problem. We ordered the new O-Ring and locking ring from the Hyundai dealer and used our special tool (Hyundai special lock ring removal and installation tool is needed to remove or install the lock ring) to remove and install the new parts. We tested the system once again and found no leaks confirming our repair. Now we had to explain to the vehicle owner that he had to drive his vehicle around for a few days with the MIL still illuminated. The reason was that the vehicle's EVAP system had to be cold in order to perform the test. If the repair was successful the MIL will go out and the DTC would erase itself indicating the vehicle was repaired.

Example to the right is the ATS Bulleye leak detection system finding another leak on a Jeep gas tank.



*Article by*

***"G" Truglia TST President and ASE Triple Master, CNG, L1 Technician***

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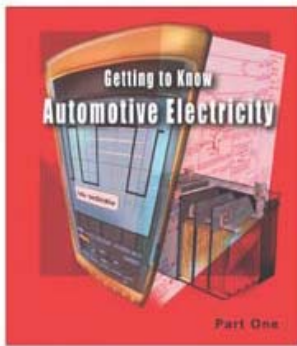
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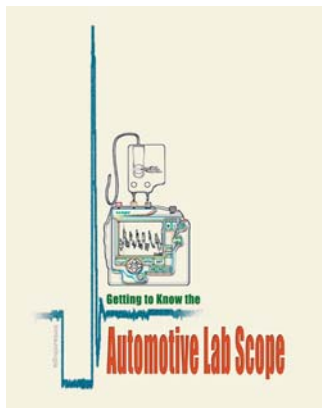
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## ***"SAAB MAF"***

2002 Saab 95 2.3 Turbo with a P0101 came in with the MIL illuminated and a complaint of power loss. We asked the vehicle owner when they first noticed the problem and if anything work or maintenance had been performed recently. The vehicle owner told us that she keeps up on all the maintenance on her vehicle. We started our diagnosis with a visual check to make sure that there were no broken or loose hoses causing the problem. Since our visual came up short we connected the Saab factory scan tool to check all the systems on the vehicle. What we found was a P0101 that indicates a Mass sensor performance problem. Next we checked the Freeze Frame data to see if it would pinpoint any data that could be helpful to us during our diagnosis. We followed that by removing the air boot from the throttle plate only to find that the screen for the MAF was very dirty. We cleaned the MAF with CRC MAF cleaner restoring it to the proper specifications, but we still need to find out the root cause of the problem of the dirty MAF. The owner of the Saab was surprised on what we found.



***(Con't on page 9)***

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### *"Saab MAF" (con't from p. 7)*

In many cases the vehicle owner believe that they have performed the proper maintenance on their vehicle simply because they have their vehicle maintenance performed at a quick oil place. That's not to say that all quick lube shops do a poor job maintaining vehicles, but in this case the quick lube shop that worked on this vehicle did not dig deep enough in locating the air filter.

As you can see this air filter really needed to be replaced but because they did not perform proper maintenance the Saab owner had to spend more money in the long run. The air filter was clogged and full of



debris in the housing and air tube. This neglected air filter caused the MIL to illuminate and could have caused a more serious problem if it did not come on. The air filter is located on the front lower side of the front fender and is not the easiest to find. This could explain why the filter was never changed by the quick lube shop. Use this example or one that you have experienced to explain to your customers the need for proper maintenance of their vehicle. Tell them that their service should be performed by a trained, certified and properly equipped shop like yours.

The fix for this problem Saab was to clean out the leaves and debris, and install a new air filter. We cleared the DTC then took the vehicle for a test drive to confirm that it was fixed.

*Article by*

*"G" Truglia TST President and ASE Triple Master, CNG, L1 Technician*

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## *"Reprogramming With J2534 "*

Believe it or not reprogramming is nothing new, in the 80's most likely you worked on GM vehicles and changed a MemCal/PROM or two. The purpose of the MemCal, PROM and today's reprogramming is to update the ECM/PCM with the most updated information. Since we are concerned with today's software reprogramming we will discuss the generic J2534 unit and how and why to use it. So let's get started. What is J2534? J2534 is the Regulated Standard for installing software in onboard light duty vehicle computers. It sometimes goes by the following names, ECU Reprogramming, Flash Programming, Pass-Thru Programming, Calibration Updating and Software Updates. J2534 was created for aftermarket shops as a means to repair vehicle emissions systems without purchasing the OE scan tools. Pass through reprogramming dumps software downloaded (or CD, old style) to a laptop from the internet to the J2534 tool. The J2534 tool is then connected to the vehicle diagnostic link and the data is transferred to the PCM. Some OEs such as GM, BMW, Jaguar, Toyota, Volvo and VW use the J2534 interface not only for reprogramming but provide full factory scan tool functions. As with any software you have to make sure that your laptop meets the requirements for the OE that you are working on. If an aftermarket shop wants to get into the reprogramming business they will need to have the following, a laptop or PC, internet connection, J2534 tool, a subscription to an OE website (or purchase a one or more day access) and the vehicle that needs the update. Remember that not all OEs use the same requirements for software or hardware. Make sure you read their requirements before purchasing anything. A good rule of thumb is to purchase a laptop with Windows 7 Professional, Intel processor (NOT A Celeron), at least 4 GB of RAM, 32 BIT (some require 64 BIT) minimum 2 USB, and wireless connection. The laptop will need Windows Explorer, Acrobat Reader and Java with NO Virus protection. Next you will need access to the OE information, this can be accomplished by going to [www.NASTF.org](http://www.NASTF.org). Once you're on that web page select the OE websites tab that is on the left of the page and read the information on programming.



*(Con't on page 15 )*

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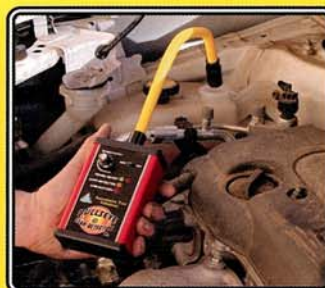
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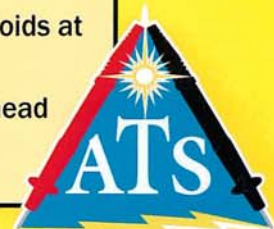


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## *"Reprogramming With J2534" (con't from p. 13)*

Your next step would be to login and provide all your information, including a password so you can continue to the page where you will select the programming information or scan tool access. After that is completed you are able to download the updated data from the OE website to the laptop. Make sure your laptop meets the hardware and software requirements for the manufacturer. This is followed by connecting your J2534 tool to the vehicle DLC (Diagnostic link Connector). Software tools such as Drew Tech's Tool box make sure that the J2534 box has the correct firmware and software installed. The Tool Box application also checks the laptop connection to the J2534 box and vehicle along with the ability to check DTCs and provide helpful information and videos. This application takes the guess work out of proper PC connection of the device and device to vehicle.

### Logging On

Our example vehicle is a GMC so we need to go to the GM website and select Service and Reprogramming Information from the list. The next step is making sure you select TIS2 Web Service Programming for J2534, filling out the form, paying a fee, then downloading the program that will be installed into the vehicle's computer(s). Make sure that the following are completed; laptop is plugged into a power source, all the connections to the DLC are tight, the J2534 box is attached to the laptop and a very important step is making sure a battery maintainer such as Fronius, Assocoated or Midtronics GR8 battery maintainers, is connected to the vehicle. All of these special chargers maintain battery voltage with very low AC voltage output which is very important in order to prevent any problems during the process. The battery maintainer is a very important tool to use when reprogramming. Not using one can cause catastrophic damage. Do NOT reprogram any vehicle without using one of these maintainers. Do not use a battery pack since it will not maintain the proper battery voltage. Make sure that all vehicle accessories are turned off and that there are no interruptions during the procedure. Make sure that doors are not opened during the process.

*(Con't on page 17)*

# LAUNCH

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## *"Reprogramming With J2534" (con't from p. 15)*

### Remember Case Studies

A 2012 GMC Yukon 5.3L with an illuminated MIL came in with an idle problem along with a P2135 (Throttle Position Correlation) DTC. If you follow the GM recommended procedure for the DTC you will be instructed to check voltages at the APP, that in this case were all within specification. Following their chart will lead you to replacing the throttle body, only to find out that the same problem exist. We had a few other GM vehicles from other shops that had already replaced the throttle body with new GM units that encountered the same problem. In cases where the throttle body is defective and needs to be replaced the unit must be relearned by following the procedure on the scan tool. But you're not done there, you will need the capability to reprogram the vehicle in order to complete the repair and prevent the P2135 from coming back. The fix on this vehicle was just to reprogram the vehicle without changing the throttle body. It's not always replacement of parts that fixes the vehicle.

2012 Nissan Altima came in from another shop with a P0101 (Mass Air Flow Sensor) that to some may be a simple diagnosis. If you are thinking that the MAF sensor needs cleaning or replacing you would be dead wrong and the vehicle would still have the same problem. Selecting any Generic/Global scan tool along with the proper service information would be the right place to start. In fact doing the research was what led to the proper diagnosis. The shop that sent us the vehicle looked up the correct information in Identifix while we confirmed it with Alldata. The fix for this vehicle was not a cleaning or replacement of the MAF, but rather reprogramming the PCM. Reading the TSB (technical service bulletin) provide us will all the information we needed. Next I connected my Drew Tech CarDaq J2534 device to the vehicle along with using the Nissan NERS (Nissan ECU reprogramming software) and purchased the update software. Within an hour the vehicle was fixed without replacing any parts.

*Article by "G " Truglia TST President and Triple Master ASE L1 Technician*

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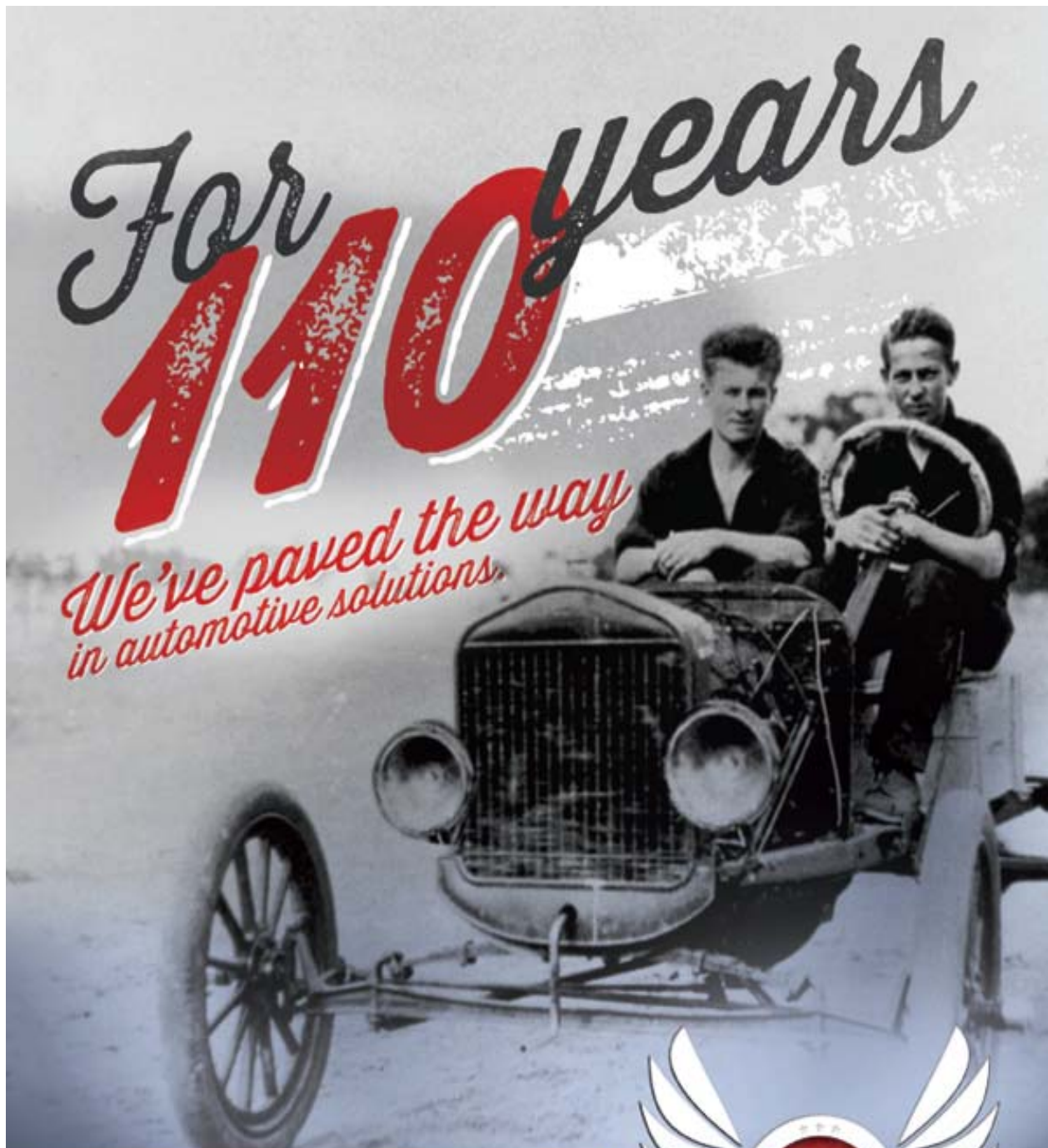
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