



## *Technicians Service Training*

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***"G" Jerry Truglia***

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### *"It Ain't Always Easy"*

A 2008 Porsche Boxster with 18,900 miles came in with a Tire Pressure Monitoring System (TPMS) problem. It was not displaying all the tire pressure readings from its four wheels. Since the vehicle is seven years old, it's possible the TPMS sensor batteries were dead. Most of the time, replacement of TPMS sensors is a routine service that can be easily done. That was not the case on this Porsche - even when we installed an OE and then a programmable sensor.

The problem was that the TPMS sensor data would sometimes read on the dash and at other times it would not be visible at all. Michael and I tried one new Porsche sensor in the left front wheel to see if it would make a difference, but it did not. Our next step was to connect the scan tool to view what was being reported to the TPMS controller. Unfortunately, the TPMS controller was not seeing the sensors even after we programmed the sensor IDs. One problem we were confronted with was that the sensor ID numbers would sometimes be displayed and would change from wheel to wheel. As we continued our diagnosis, we decided to change the TPMS controller since the symptoms were random and not making sense.

***Still Not Done***

We located the TPMS controller under

***(Con't on page 3)***

## ***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.***

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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

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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:

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## *"It Ain't Always Easy" (con't from p. 1)*

We the hood and installed the new dealer unit. As with many Euro controllers, it needed to be programmed before it would work properly. We connected our Autologic scan tool and programmed the controller without any problems. After the programming was completed we were able to obtain the sensor IDs on the scan tool, but there was still a problem. The four TPMS sensors we programmed with our aftermarket TPMS tool were not displaying the same IDs as what was being displayed on the scan tool. Two of the sensors had the same ID number, while the other two had different numbers other than what we programmed.



**Figure 1**

The frustrating part was that we tried all three TPMS tools that we own only to find out that one of the two could not even pick up the frequency of the sensors, while the other tool was only able to provide the frequency and one of the sensors IDs. One tool read them all, but the IDs that were displayed were not correct. This simple job was turning into a real headache with conflicting information between the tools.

We called two of the TPMS tech lines only to be told that the tool should work (even though it didn't). The vehicle had to be driven to make sure the TPMS sensors reported the proper information as the final part of the repair. Since nothing was working 100 percent after we installed the new TPMS controller, we thought the best way to proceed was to break down all the tires and program the IDs again.

We believe that because the TPMS computer was bad, it must have affected the TPMS IDs. Once we reprogrammed the 10 digits

*(Con't on page 5)*

## *"It Ain't Always Easy" (con't from p. 4)*

into the sensors, we installed the wheels back on the vehicle. We rechecked the TPMS IDs on the scan tool (now all reporting the same IDs we programmed) for each TPMS sensors. Next, I test drove the vehicle to make sure the dash display would be able to display the tire pressure for all four wheels. Take a look at the dash (**Figure 1 on page 4**). That, thankfully, was finally displaying the correct information for this orange Porsche Boxster.

### *An 'Easy' Toyota*

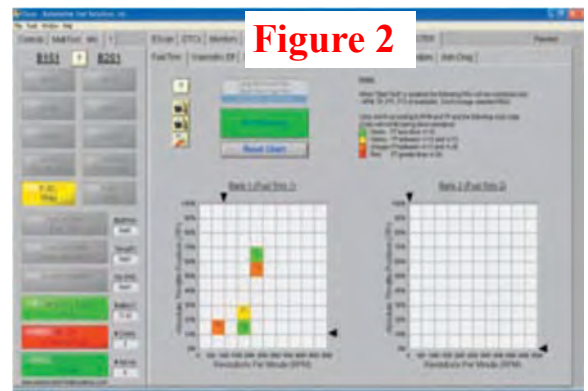
Our next vehicle is a 1999 Toyota Rav 4, 2.0L that came in with an illuminated check engine light with Diagnostic Trouble Codes (DTCs) P0171 (System Too Lean - Bank 1) and P1130 (Air Fuel Sensor Circuit Range and Performance) along with a driveability problem. This vehicle had already been to another repair shop that replaced many parts without resolving the problems, making the vehicle owner unhappy. The vehicle owner had lost confidence with the other shop's ability to repair the problem and was looking to get the vehicle fixed. It's always tough to hear that another shop was not able to repair the vehicle, especially since some vehicle owners tend to not tell you the complete story. We need to stick together and make sure we don't bad mouth each other and always suggest that the customer bring the vehicle back to the other shop. Since the customer was fed up, this Toyota was now our problem and had to be diagnosed and repaired. I gave this job to Bill, who performed a thorough diagnostic routine and came up with the DTCs along with a very high Long Term Fuel Trim (LTFT) reading.

Bill used the right approach and started diagnosing the lean DTC, looking for vacuum leaks that are common on Toyota models. Many of the high LTFT readings that I have found on Toyotas have been due to manifold gasket problems when an engine is cold. A check of the Freeze Frame data, though, showed that the engine temperature at the time the code matured was 192°F, so that ruled out the intake gasket problem. To make sure there were no vacuum leaks, Bill smoked the engine with our evaporative *(Con't on page 6)*

## *"It Ain't Always Easy" (con't from p. 5)*

What else would cause a lean condition? Maybe low fuel delivery, EGR leak, a faulty air fuel ratio sensor, MAP sensor and maybe something else. So rather than guessing, Bill decided to do some research and spend some time online with our service information resources. What he uncovered was that the Bank 1 downstream oxygen sensor (B1S2 O2) could control fuel trims. Before he went too deep, he needed to check the basics, including fuel pressure (in spec) and fuel volume (also in spec). With fuel and vacuum leaks out of the way, the next things to check were the sensors.

Bill verified the sensor inputs all the way to the rear oxygen sensor, which was reading zero volts. We reviewed the Freeze Frame data again to see if we missed anything while checking the current scan data. We found the LTFT reading was the same 44 percent as the Freeze Frame data had reported, along with the rear O2 sensor's zero voltage reading.



Take a look at the EScan Fuel Trim screen shot where Short and Long Term are high at idle and at 60 percent throttle (**Figure 2**). When we checked the voltage reading of the AF sensor on the scan tool, the voltage was under the normal 3.3 volts at idle, only reading 3.15 volts. The low voltage reading on the AF indicates that the engine was running rich. The odd thing that we noticed was that the rear O2 sensor was still staying at zero volts and not changing as the rpms were changed.

"It's always tough to hear that another shop was not able to repair the vehicle, especially since some vehicle owners tend to not tell you the complete story."

*(Con't on page 13)*



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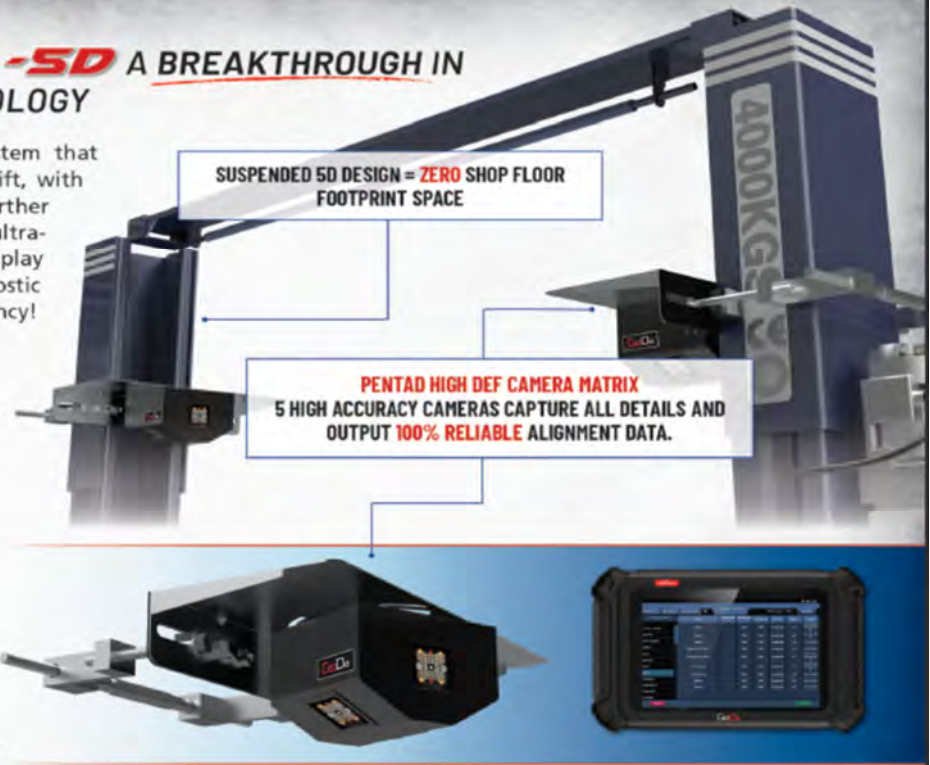


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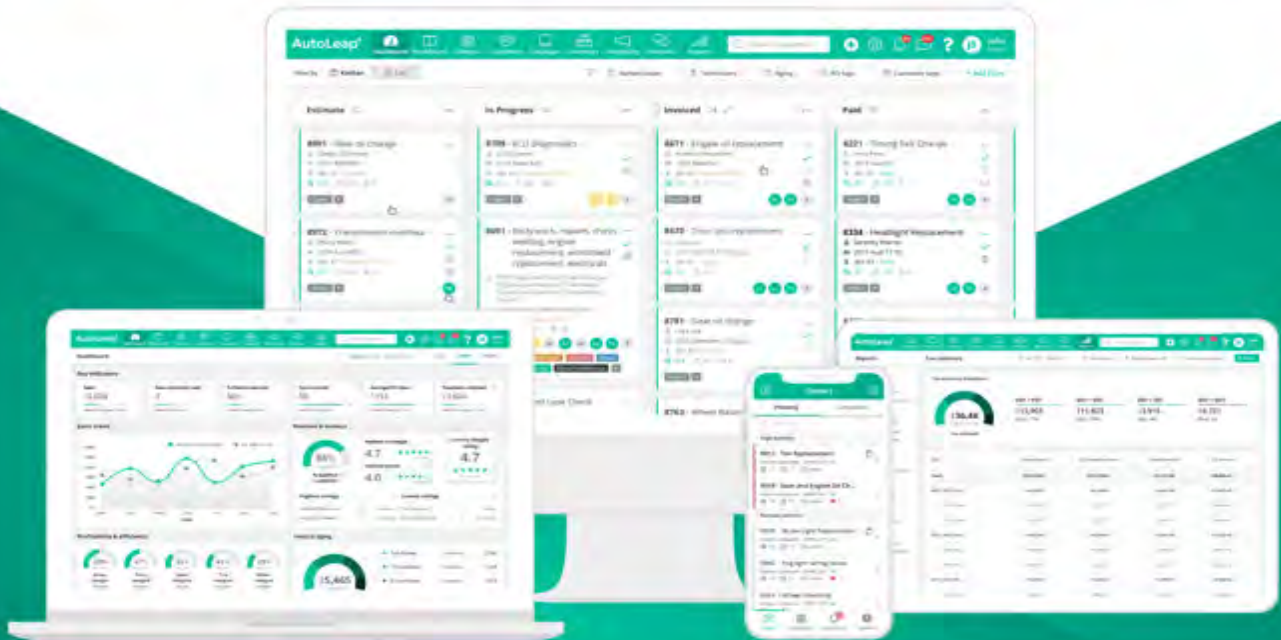
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## *"It Ain't Always Easy" (con't from p. 12)*

Many vehicles use the rear O2 sensor as an important input signal that will play a part in adjusting fuel trim readings. So we decided to replace the rear O2 sensor followed by removing both the battery cables and installing a one ohm - 10 watt resistor to clear the capacitors to reset the adaptive fuel trims. We test drove the vehicle to see if there was any change in the 44 percent LTFT readings.

We were rewarded with a +9 percent on the LTFT and the Rav4 was no longer exhibiting any driveability problems. We test drove the vehicle one more time making sure no DTCs reset before returning it to the happy customer.

*Article By*

*"G" Jerry Truglia*

*TST Founder and President*

*ASE World Class Triple Master*

*Auto, Truck, School Bus L1, L3, F1, X1, C1, Technician*

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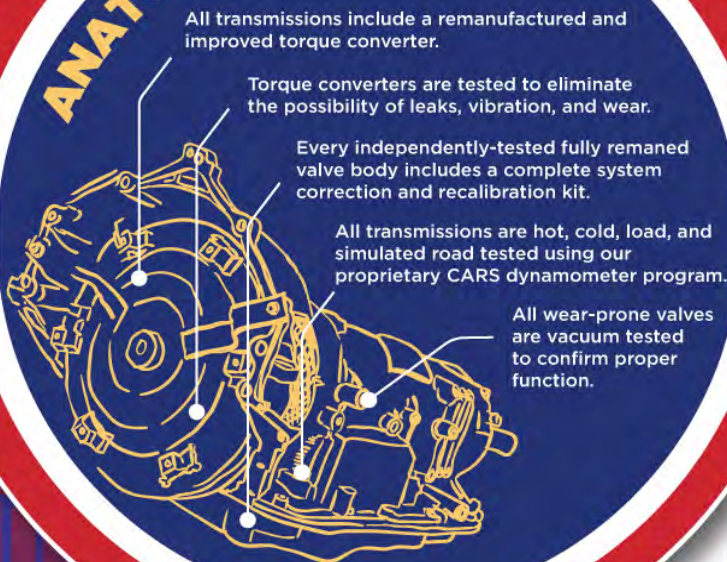
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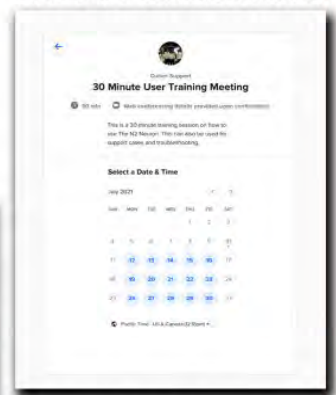
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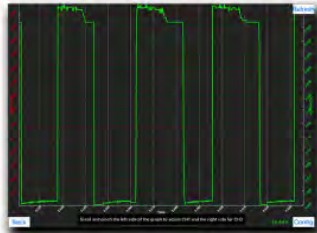
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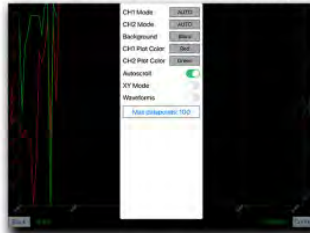
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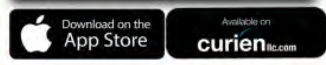
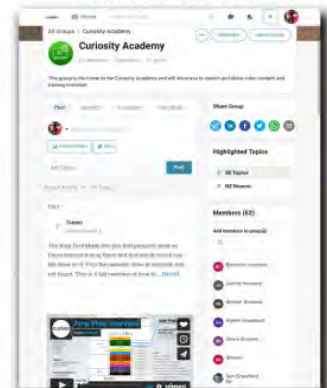
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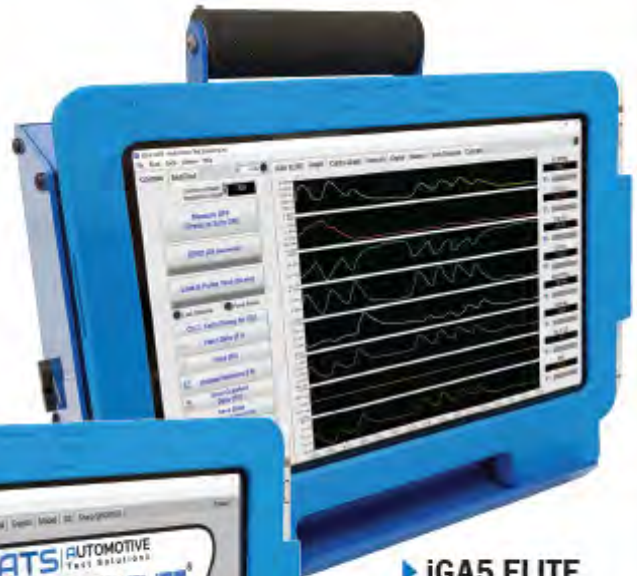
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