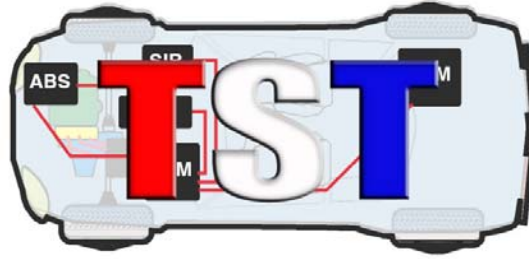


June 2016



Technicians Service Training

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Upcoming Seminars:

Late September /October

MA, CT, NJ & NY

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Editor

"G" Jerry Truglia

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"Engine Eats Oil In 100 Miles"

Our TST member Curt Lockhart from Kentucky came across a 2003 Nissan Altima with a 2.5 L, 4 cylinder engine with about 110 k that came in with an oil leak. There is nothing unusual about a engine that is leaking oil, whether from a worn valve cover gasket, cover or other areas. So after diagnosing a bad valve cover, Curt ordered a new replacement cover from his local NAPA store. Once it arrived he replaced the valve cover with the Dorman brand replacement that seemed to fit perfectly. Curt ran the engine for awhile and road tested the vehicle to make sure that there were no leaks. Since the engine was now leak free he billed the owner out and moved on to the next job. About a month or so later Curt received a call from the Nissan owner stating that the engine was using a 1/2 quart of oil every 100 miles or so. Curt could not understand why the engine that was only leaking some oil before was now consuming a 1/2 quart of oil so quickly. Upon removing the valve cover (**Figure 1—see page 2**) and inspecting it carefully he found some internal damage to the cover. Not sure why the cover had this damage, he called NAPA for another cover so he could compare the two. When the cover arrived the comparison of the two revealed a difference in the PCV breather area.

(Con't on page 2)

"Engine Eats Oil In 100 Miles"(con't from p. 1)

Curt now decided to call the Nissan dealer and ordered an OE valve cover so he could compare the two side by side. What he found was that the Dorman valve cover had a casting difference from the OE Nissan valve cover.



Figure 1

Take a look at the damage (above picture) that was caused by the intake camshaft to the PCV breather passage. With the damage to the breather tube, engine vacuum is available to suck oil from the head area, this explains the high oil consumption. Curt placed the two new valve covers together and measured the differences from the Nissan to the Dorman. When he found that there was a difference between the two, he called his NAPA store. Making NAPA aware of the valve cover defect will help other shops from having the same problem saving them time and possibly a customer. The NAPA store did their homework and followed up on the problem contacting Dorman and getting Curt money for his labor. Take a look on page 4 (**Figure 2 & 3**) of the different valve covers and the different locations of the PCV breather tube.

(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.

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 **\$75.00 yearly membership**, the seminars are only **\$80.00**. **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 80 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

Bob Pattengale of Bosch

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:

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"Engine Eats Oil In 100 Miles" (con't from p. 2)

The new Nissan valve cover was installed and the oil consumption problem was no longer an issue.



Figure 2

Curt did the right thing in contacting his part store and taking pictures to back up his findings. This article is a help to all shops out there. We need to make sure that we report problems and make others aware. All you need to do is take some pictures and write down the year, make, model, mileage, engine and problems so I can write your information up.



Figure 3

Article by Curt Lockhart

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Toyota (TechStream)



VW/Audi (ODIS)



Volvo (VIDA)



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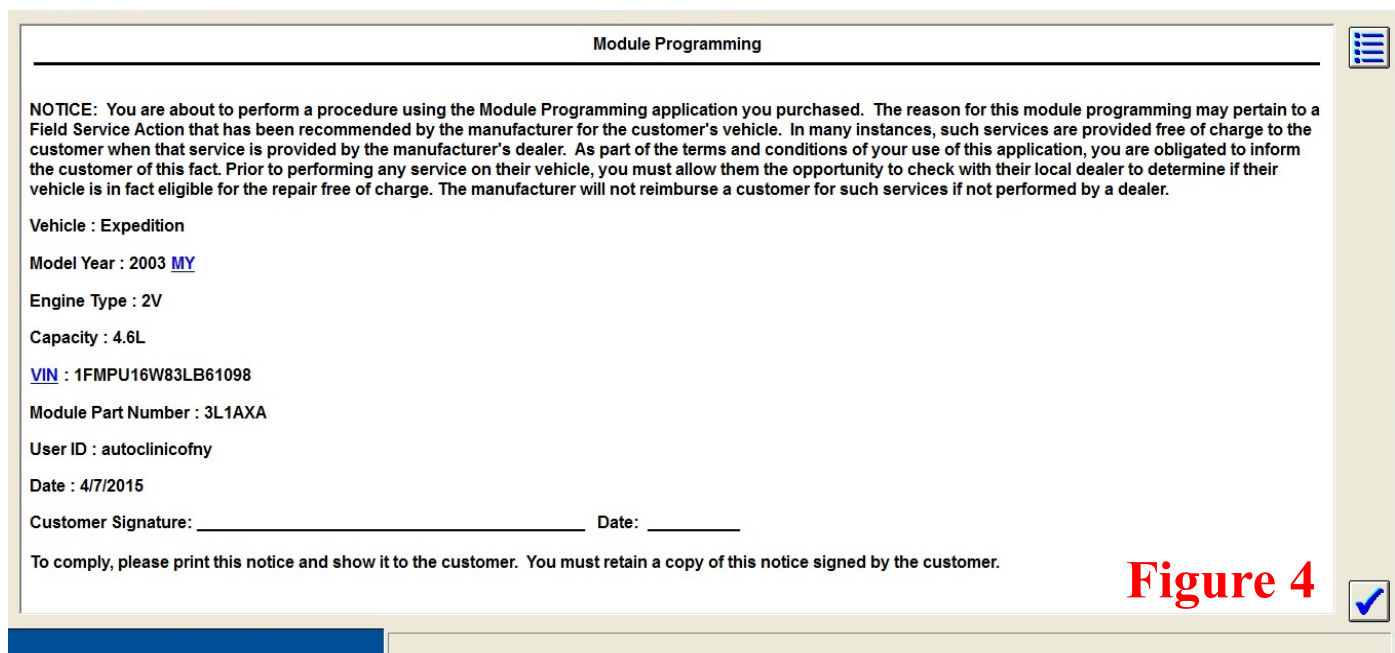
"Bits and Pieces From TST Bays"

We had a 2003 Ford Expedition 4.6L V8 with 110552 miles come in with the following DTCs; P0135, P0141, P0151, P0161 and P0443. The vehicle was already at the Ford dealer that had diagnosed the vehicle and told the owner that the O2 sensors had to be replaced along with the PCM. Since the owner was not happy with the Ford dealer diagnosis they researched an alternative and found us. We checked the vehicle out and confirmed the dealer diagnosis of DTCs then proceeded to check for TSBs, finding one that related to our DTCs. We called the part store for the PCM but they did not have a listing, so we contacted the dealer. The cost of from the dealer was over \$800.00 so we needed to make sure that it would solve the problems before we replacing it. We checked all the O2 sensors heaters for battery power and ground making sure that the heaters actually worked. The O2 sensors were very difficult to reach but needed to be tested in order to rule them out. We found that the sensors had power but no ground, leading to us to the PCM to see if it was able to do its job. When we used the Power Probe to test the sensors we found that they were capable of drawing the correct amount of current and heating up properly. The PCM problem was now confirmed since we proved that the components (O2) could function properly. The vehicle owner did not want to spend a bunch of money on an old vehicle and asked us to find the most reasonable way in repairing it. Since the new unit was so expensive and there were no aftermarket unit available we called AutoPCMs.com. Lucky for us they had a PCM that they shipped overnight so we could see if it resolved our problem. Now remember that you are not working on your father's Oldsmobile anymore since PCM's are not just plug and play without reprogramming them. Having the Ford IDS we could purchase a used PCM and program it to confirm our diagnosis. We were confident that the PCM was the problem since we tested all the power and ground along with all the actuators for any excessive amperage draw. Since AutoPCMs.com has a policy of shipping a PCM for \$75.00 that is backed by their return policy we would not be out much if it did not resolve the issue. Their website states that if an electronic unit was ordered but a misdiagnosis was discovered, return the unit for the cost of \$75.00 for trying the PCM and \$15.00 for shipping.

(Con't on page 8)

"Bits and Pieces From TST Bays" (con't from p. 7)

With the used PCM in hand that only cost us about \$550.00 we installed it in the vehicle and reprogrammed (**Figure 4**) the unit so the PCM would display all the correct information. There is a very important step when programming the PCM whether a used or new Ford PCM is being installed. Ford has an anti-theft system called PATS (Passive Anti-Theft Systems) that has to see keys that match the PCM or the engine will not start. Make sure to have at least two OE keys available or the procedure cannot be completed properly and the vehicle will not start. You should also have all the key fobs for the vehicle and know if there is remote start available on the fobs. If that is the case you will have to program the fobs as well. Another important step when programming a vehicle is to utilize a battery maintainer and make sure you type in the vehicle VIN number and other important information. After we completed the programming the engine started up and ran great. I took the vehicle for a test drive to make sure that Mode 6 test would display passing test results as to confirm our repairs. We were lucky since after two test drives all the Monitors except EVAP were Ready. The next morning after the vehicle sat overnight we test drove it again which completed all the Monitors confirming our repair. Now we had a vehicle that would pass inspection and was repaired for a reasonable price.



The screenshot shows a software window titled "Module Programming". Inside, there is a "NOTICE" section with a disclaimer about the service being provided. Below the notice, several fields are populated with vehicle information: "Vehicle : Expedition", "Model Year : 2003 MY", "Engine Type : 2V", "Capacity : 4.6L", "VIN : 1FMPU16W83LB61098", "Module Part Number : 3L1AXA", "User ID : autclinicofny", and "Date : 4/7/2015". At the bottom, there are lines for "Customer Signature:" and "Date:", followed by a statement: "To comply, please print this notice and show it to the customer. You must retain a copy of this notice signed by the customer." A blue checkmark icon is visible in the bottom right corner of the window.

Figure 4

(Con't on page 10)

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“Bits and Pieces From TST Bays” (con’t from p. 8)

Note: If you want to confirm your repairs on an OBD II vehicle and make sure the vehicle does not come back with an illuminate check engine light, try getting the Monitor to run and become Ready. If vehicle’s Monitors are not Ready you can’t be 100% certain the DTCs won’t return or that the vehicle is repaired. The MIL or check engine light then becomes “the you suck light”. I am happy to say the vehicle ran well and we don’t suck since no DTCs returned.

Our next vehicle is a 2009 Honda Pilot miles with 135739 miles and DTCs P0420 and P0430. This vehicle had not been maintained properly and the owner did not want to spend any money. We told the owner we had to charge him for a diagnosis to reveal the vehicle problems. What we found was the following problems; it needed a tune up, thermostat, coolant flush and new catalytic converters. The Mode 6 data (**Figure 5**) displayed failures on the catalyst, and misfires on cylinders along with Air Fuel sensor that was border line. To get this vehicle back in good running condition it needed the oil changed, a complete tune up that had never been done, a fuel system cleaning and new converters.

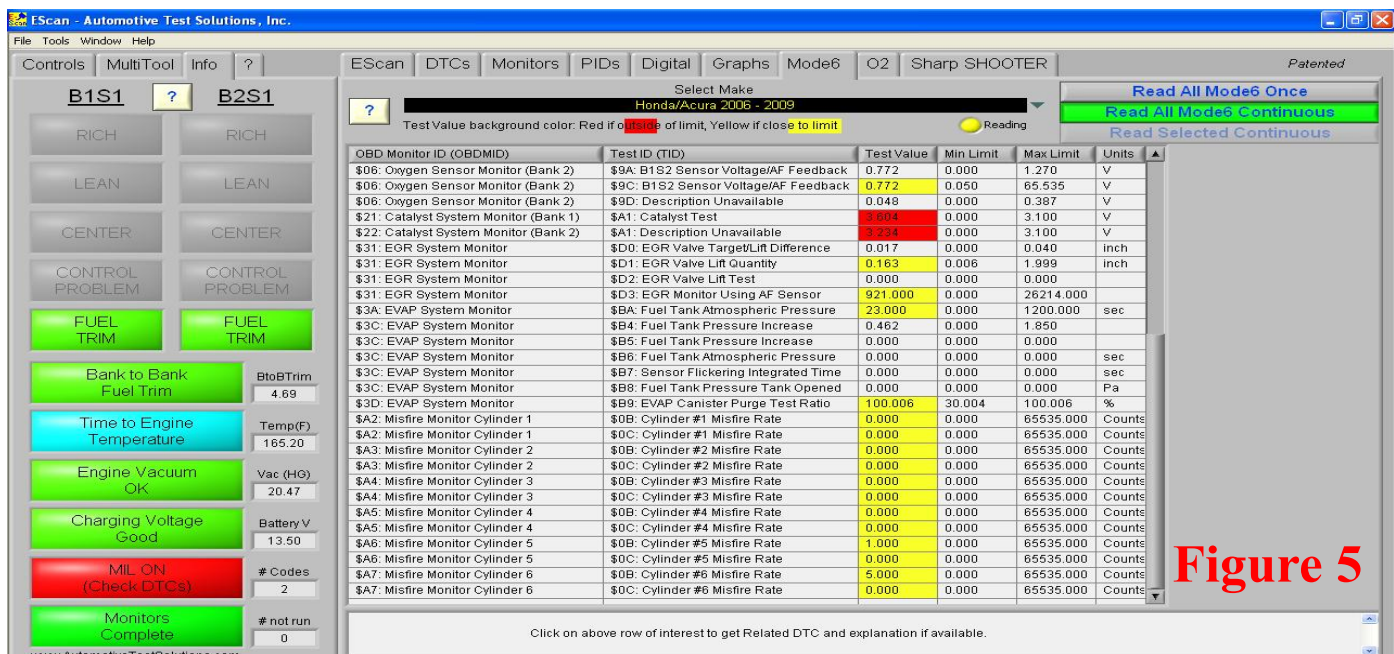


Figure 5

(Con't on page 11)

"Bits and Pieces From TST Bays" (con't from p. 10)

Take a look at some of the test results on this vehicle starting with Fuel Trim. The Escan STFT and LTFT (Figure 6) graphs for both banks were way over the normal limits. Bank 1 at idle was commanding 26 and Bank 2 was adding 16 while both had rich command all the way through the range with the exception of rpms over 3500. The engine also had a thermostat problem that most likely contributed to the P0420 and P0430. Looking at the thermostat (Figure 7- page 13) test I noticed that the cooling system was not warming up in the proper time frame. This condition would have made this engine run richer while still producing heat inside the vehicle and not raise a flag. This is a common problem that is overlooked since there is no complaint of a lack of heat. It's a good idea to make sure that the engine temperature is rising about one degree a minute while warming up. Our next test was to check Volumetric Efficiency on this 3.5L engine by using the VE (Figure 8 - page 15) tab. As the throttle was depressed during this test I noticed the yellow line (actual results) versus the red line (calculated amount) did not look right.

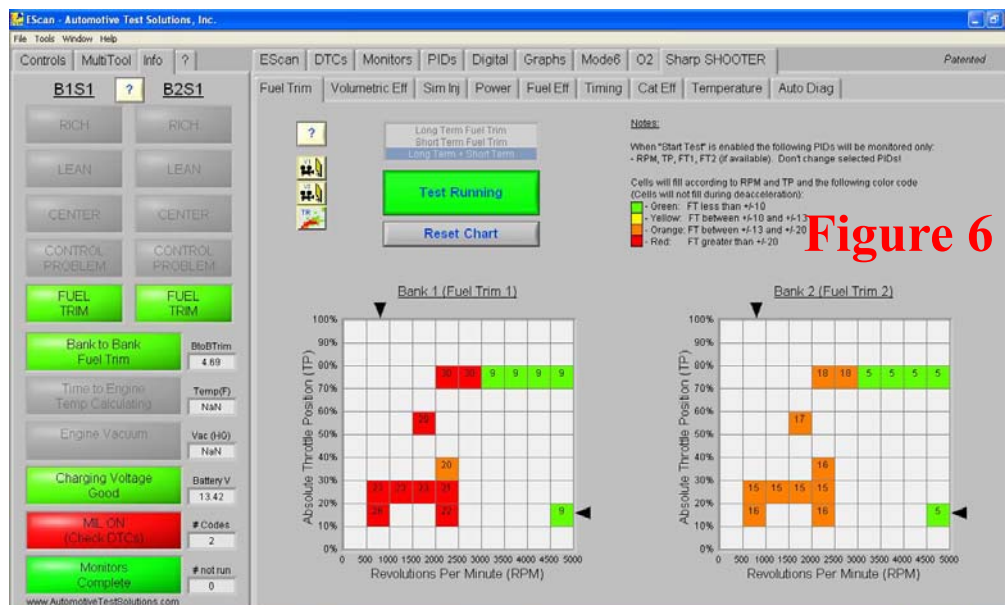


Figure 6

Getting to Know Automotive Electricity
Part One

Batteries
Starters
Alternators
Common Tests and Testers
Circuit Types
Ohm's Law

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Getting to Know the Automotive Lab Scope

(Con't on page 13)

GTC505

Engine Ignition Analyzer



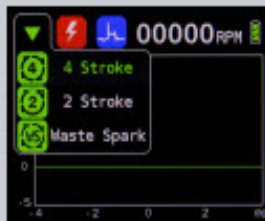
Quick, powerful and easy to use

- ▶ Plug the appropriate sensor pick-up into the flexible probe
- ▶ Select the engine's cycle (4-stroke, 2-stroke, or waste spark)
- ▶ Select the measurement type and display format
- ▶ Place the pick-up on top of the ignition module, or over the spark plug wire
- ▶ The GTC505 will automatically detect and adjust all parameters to provide accurate measurements and clear graphs

Useful for troubleshooting:

- ▶ Non-starts
- ▶ Misfires
- ▶ Intermittent problems
- ▶ Primary and secondary coil circuits faults
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Complete ignition system diagnostic:



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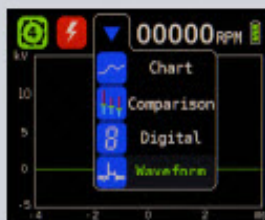
Displays secondary ignition waveforms.



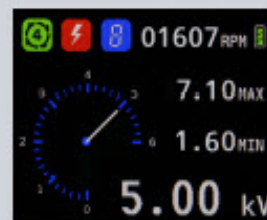
Displays and measures spark burn (firing) time, dwell time, current ramp time, RPM, and spark plug peak voltage.



Candlestick graph compares maximum, minimum and average measurements of several cylinders.



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Analog gauge and digital readout with maximum and minimum.



Specially designed pick-ups for coil on plug ignition modules (left) and spark plug wires (right).

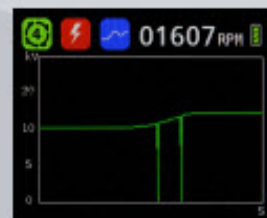


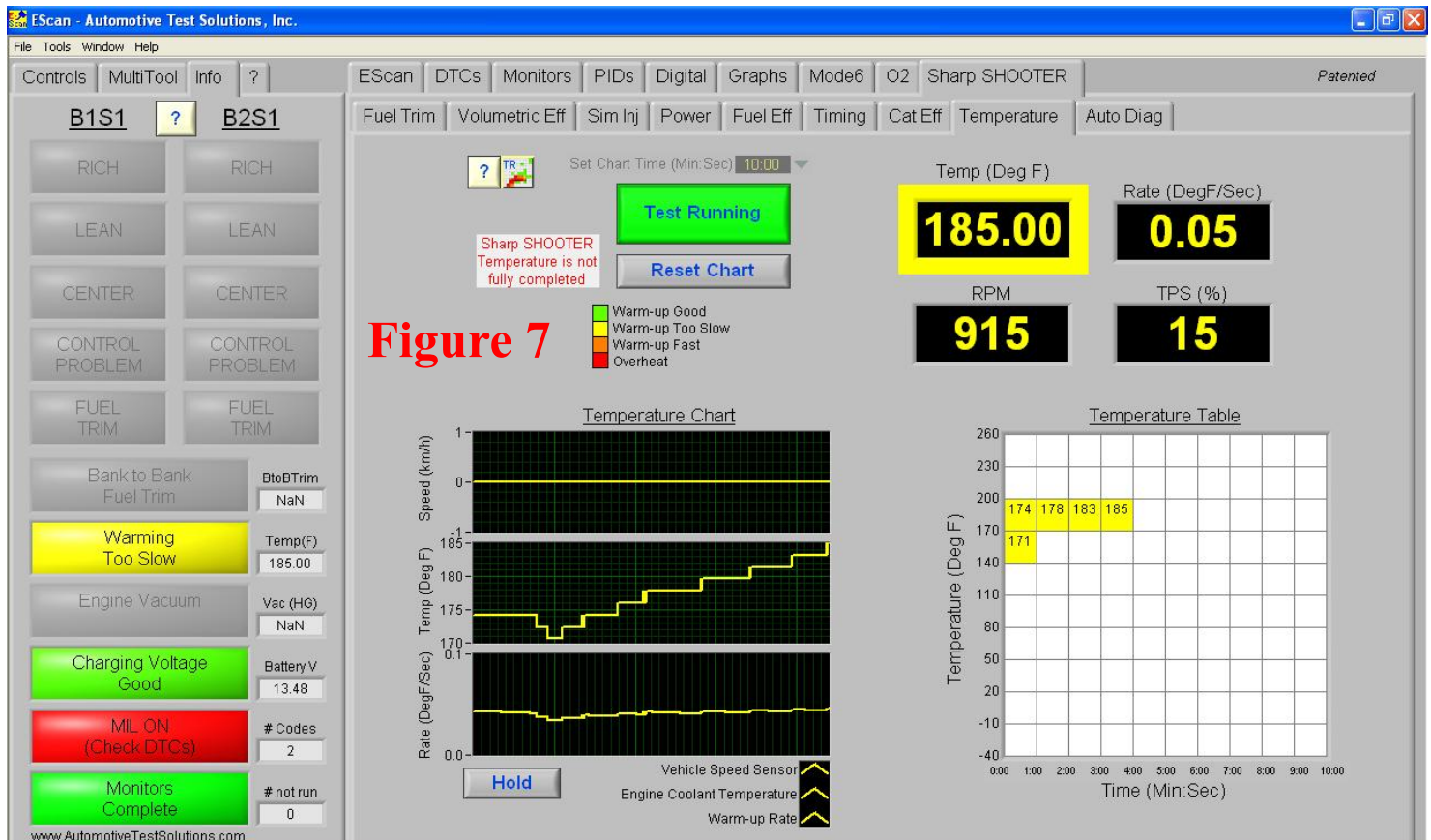
Chart mode used for detecting intermittent or infrequent failures and misfires.

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"Bits and Pieces From TST Bays" (con't from p. 11)

One problem with the test results not being as accurate was due to the elevation being about 460 feet lower than the correct elevation of 660 that we are at. The



setting of the wrong elevation could cause the wrong calculation of the red line therefore being lower than normal. Even with the wrong setting the results of the test had the important information that indicating a problem. The problem with the VE test results was not that the MAF and intake system would not reach the proper height on the test, but rather what the top of the yellow test line indicated. The zig zag (Bart Simpson hairdo) of the top of the yellow line indicated that we had a clogged exhaust system. This information would make sense since the vehicle came in with the complaint of low power and the MIL illuminated. Now when you put all the information together DTCs, Freeze Frame, Mode 6 information, thermostat, misfire information, test, volumetric test and an engine that had never been tuned up we can conclude that the catalytic converters were indeed bad. Unfortunate for us the vehicle owner decided not to fix the vehicle. If he decided to repair this vehicle we would have

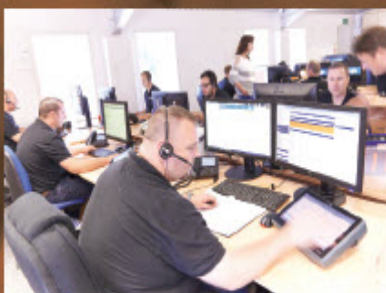
(Con't on page 15)

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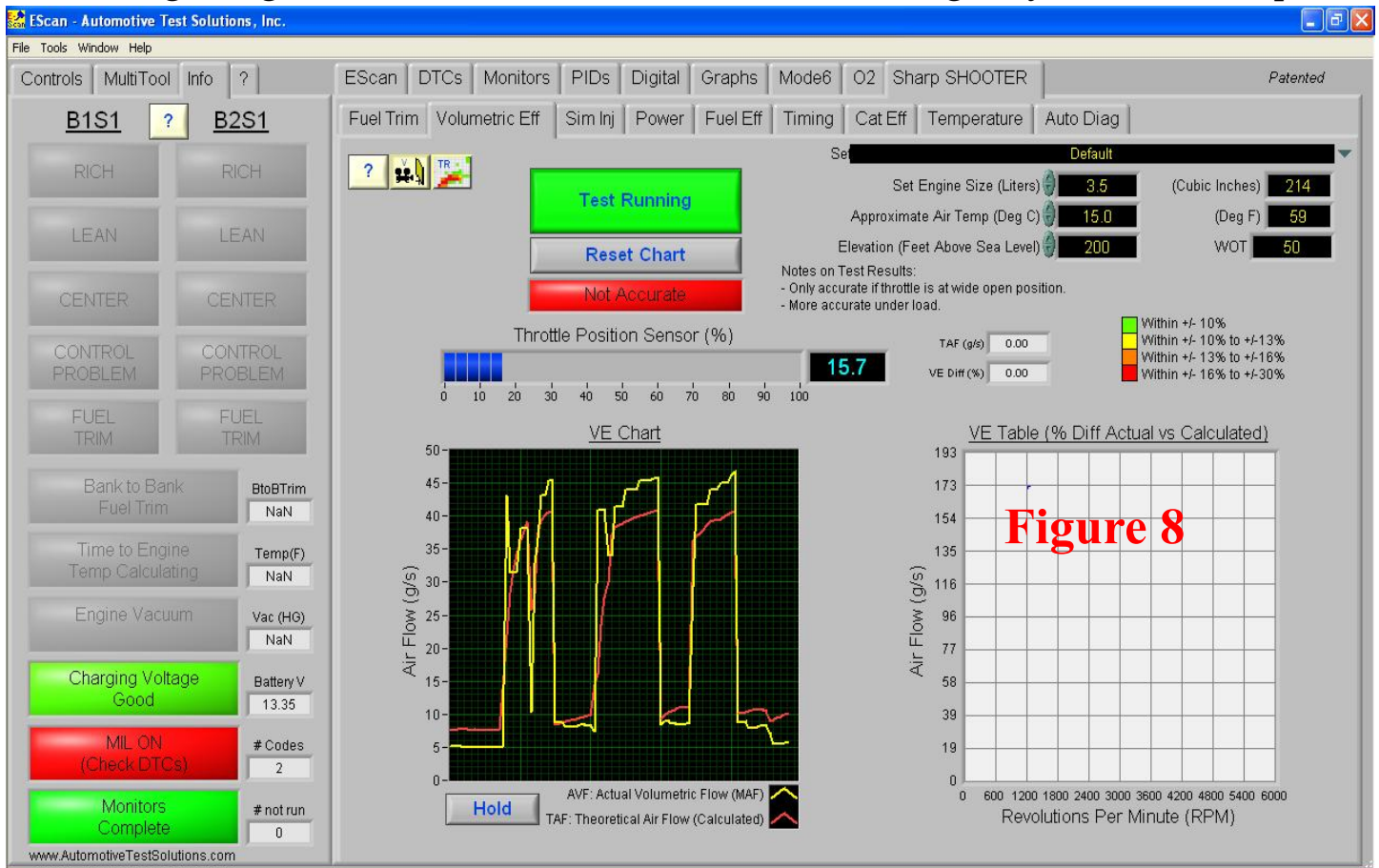
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THE SMART CHOICE FOR EUROPEAN VEHICLE DIAGNOSTICS

“Bits and Pieces From TST Bays”(con't from p. 13)

recommended a complete tune up, fuel system cleaning. If the converters were not bad we would have disconnected a coil or wire (ground the spark plug wire) on each bank. With the spark disabled the converters load up with fuel as the idle is raised up to 2500 rpms for 3 minutes. If the converters show improved numbers in Mode 6 data, we recommend a fuel system cleaning that usually works in getting the converters back online. The cleaning may have to be repeat-



ed a few times to bring the cats back to life. Remember that if the engine has over 60K on it, the carbon build up can be more difficult to clean up. We have been very successful using this test and clean procedure that usually gets the system working correctly without replacing the converters. Now in this case there is a big possibility that these converters would not come back to life since the VE test indicated a possible restriction. If you use the diagnostic game plan that we used on this vehicle you most likely will come up with a proper diagnosis in a shorter period of time. It takes the proper tools, equipment and most important education in making a proper diagnosis and repair of a vehicle.

(Con't on page 16)

"The Running Rough Cold Bimmer"

Our next problem vehicle is a 2004 BMW 745i 4.4L with a complaint of engine misfire only when the engine was cold. This vehicle was at a BMW dealer before coming to us for a diagnostics and reprogramming. The BMW owner was told that the engine needed repairs costing over \$5000.00 that was due to a defective Valvetronic unit. Since the owner did not trust the diagnosis from the dealer he decided to call me after watching a few of my webcast on YouTube. After testing the engine I seen what most likely happened, and why the dealer recommended the Valvetronic repair. There is a TSB on rough running that relates to the Valvetronic unit along with another TSB for reprogramming the ECU. The dealer performed the reprogramming of the ECU but it did not resolve the problem. The mistake in a proper diagnosis by the BMW dealer cost them a good customer, all because they over looked checking the basics. Since the vehicle had DTCs we were able to review engine data in Freeze Frame confirming the cold problem issue. Our next step was to inspected the engine with our video scope for carbon build up since it's a common problem on these engines. Our visual looksee did result in finding some carbon but not an overabundance of it. We still recommended the fuel cleaning service to the vehicle owner since the engine had 140K on the clock. Checking the engine out hot both with our Autologic scan tool and with the ATS pressure transducer scope kit had conflicting re-

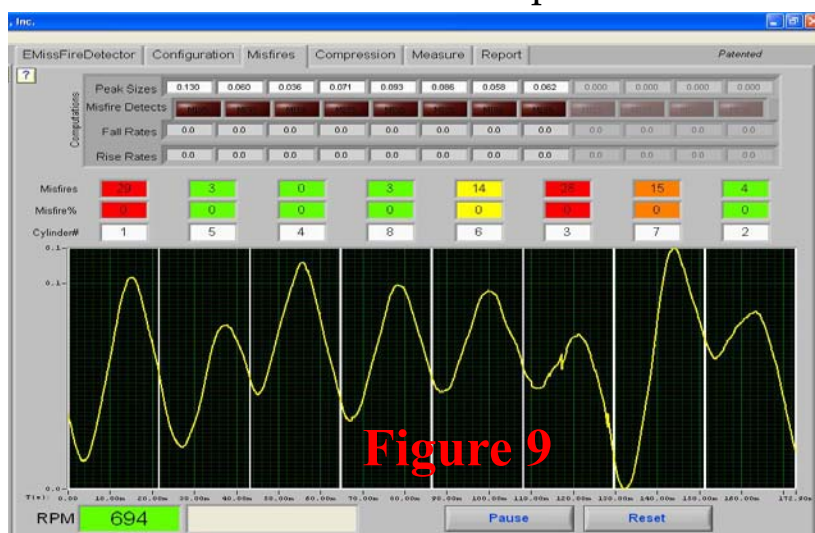


Figure 9

sults. The results from the scan tool showed very few misfires, while the ATS pressure transducer (Figure 9) found many. After performing the decarb the engine still ran fine hot with no noticeable engine misfires. We also noticed that the engine was leaking a large amount of oil so we suggested that the breather/PCV system be replaced since it was never done. We showed the owner the white oily sludge that was in the breather hose ends and made him aware of the upgrade cold weather tube kit that was available.

(Con't on page 17)

"The Running Rough Cold Bimmer" (con't from p. 16)

We suggested that he leave the vehicle with us so we could check the engine when it was cold. The next morning when the engine was cold I started the vehicle up to drive it in the bay noticing that the check engine light was flashing and the engine was running rough. Before the engine warmed up and reached operating temperature we shut it down and smoked the engine finding a high volume coming out of the intake manifold. Next we started the engine up so it could reach operating temperature then re-smoke the engine no longer finding any smoke. The results now confirmed why the engine only ran rough when it was cold and had no problem misfiring when it was hot. Now it was time to come up with a game plan by first performing a visual inspection followed by checking the battery. We found that the battery was original and needed to be replaced before moving on and performing the other repairs. With the starting, charging system components all passing the test I now could perform a relative compression test using my labscope making sure that there were no engine problems. With all the testing completed I turned the job over to Bill, who had the fun job of taking the intake manifold off and cleaning everything up. After waiting for all the parts to show up I suggested to Bill to seal up the intake plenum while it off the engine to make sure that the plenum was not leaking. It was a good move because look what we found (**Figure 10**) an intake plenum leak on the rear seam of the unit. We checked the torque on the bolts and added some RTV to the seam since there are no gaskets available for the unit, only a com-



Figure 10

plete replacement is available. After the repair was complete the real test would be if the vehicle would start up cold without flashing the MIL and running rough. The next morning with the temperature in the low 30's I started the engine up and notice the engine was running good and there was no flashing MIL or DTCs being set. I drove the vehicle for about an hour to make sure that there were no other problems before calling the vehicle owner and telling him it was ready to pick up.

*Article By G Truglia TST Founder, President and ASE World Class Triple Master
L1, L3 Technician*

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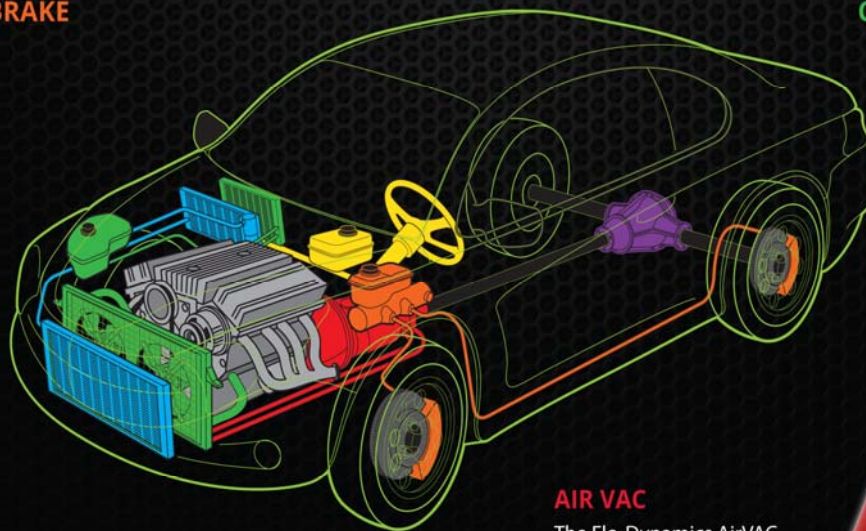
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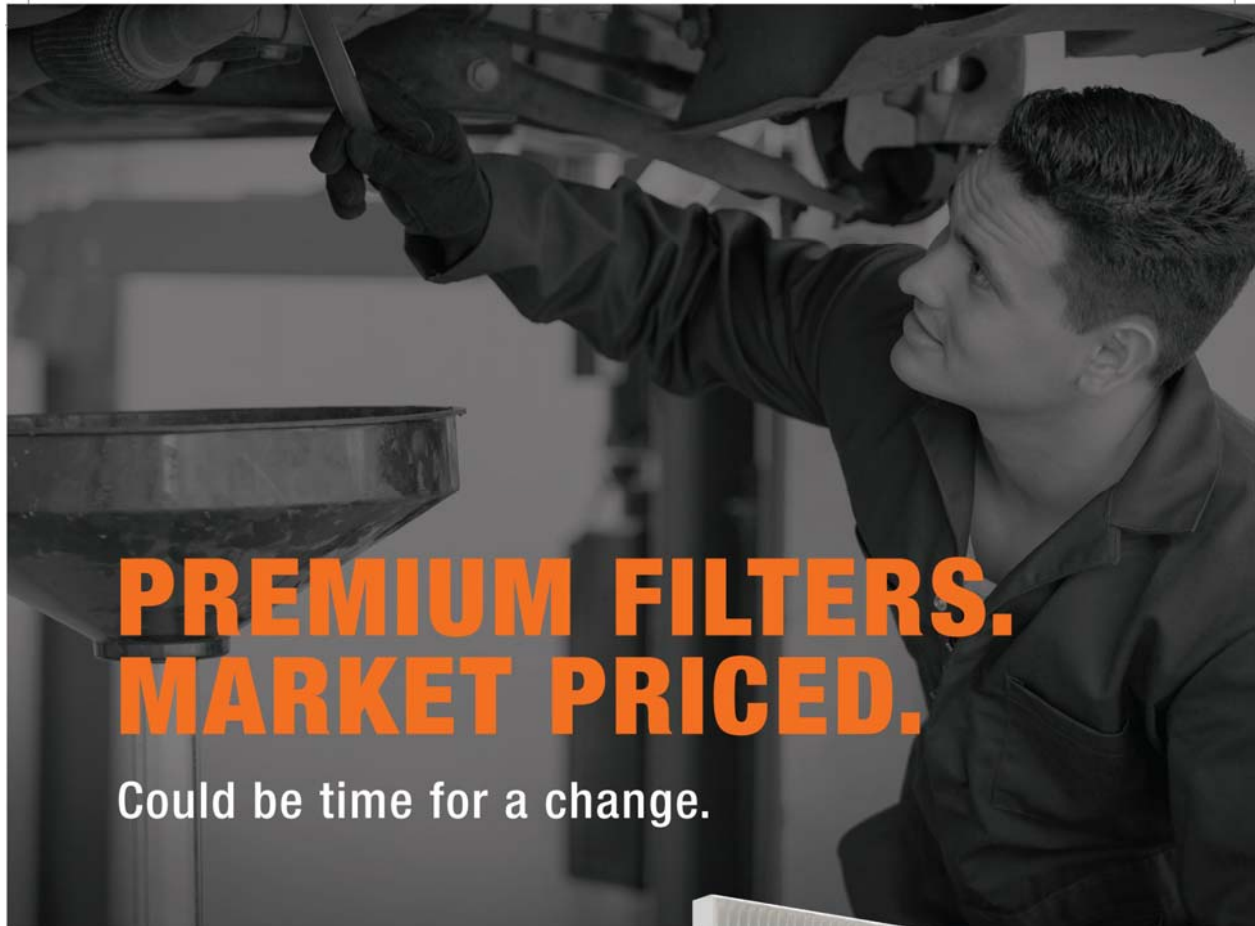


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9AM	Chu	Eagle	Brown	O'Donnell	Conn	Zumplier
10AM	Smith	Wooden	Cisco	Chin	Chang	King
11AM	Moore	Baker	Glass	Burton	Ellis	Cas
12PM	Daniels	Amber	Green	Alph	Fullerton	Dink
1PM	Fisch	Smith	Ricco	Nichols	Treash	Blake
2PM	Hovan	Perry	Green	Line Co.	McArthur	Carissim
3PM	Allen	Capstone	Testa	Baxter	Blow	Corica
4PM	Williams	Getz	Longo	Pitts	Donovan	Donovan
5PM	Merry	Papa	Warshi	Quincy		
6PM						



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