

RANDOM MISFIRE

The Quarterly E-Newsletter for the Automotive Repair Industry

Volume 1, Issue 4

4th Quarter 2007

THE GRAVITY OF THE SITUATION

Occasionally driveability issues raise the question of fuel quality. We all understand that quantities of water, or sediment, can effect fuel supply, but how can we deal with fuel quality issues?



Qualities such as reed vapor pressure, or octane rating, can be difficult and expensive to document.

Alcohol content is easier to measure but may not be

100% accurate. With today's alternate fuel options, specifically E85, fuel analysis has become more complex.

Another aspect of fuel composition that can be easily tested is specific gravity. Much like battery acid, or anti-freeze, a hydrometer can help identify if fuel is in an acceptable range.

Light fuels can be an indication of unwanted dilution. Because of a reduced boiling point they can cause "vapor lock" type conditions, cold start problems and more.

Heavy fuels can cause many issues such as contribution to fuel injector deposits and no start conditions

In both cases volatility is effected.

The introduction of water, contaminates, diesel fuel or E85 will alter specific gravity.

My point is:

If a vehicle is designed to burn gasoline, then it should burn gasoline.

If specific gravity is a good indicator of fuel quality, then we can use it to verify that the fuel in our tank is most likely gasoline.

If our specific gravity does not fit in an acceptable range we have a direction to go. If the measurement fits we continue with the diagnostic process of elimination.

To obtain part numbers for the inexpensive equipment required, and a specific gravity chart, watch the articles page of our web site.

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Points of interest:

- Join our mailing list. Fill out the form on our contact page go to: www.driveabilityguys.com
- Watch for DRIVEABILITY GUYS training at the next Illinois ASA / Odyssey show.
- We are looking for feedback on our site, training, and software. Email us your honest opinion.

THANKS TO JIM AND THE LTS STAFF!

Thank you Linder Technical Services staff for a great weekend.

The training was exceptional. Every trainer was professional and delivered valuable material in a digestible manner.

The vendors were top notch and willing to discuss products without "pushing" sales.

And the unscheduled activities were informative and enjoyable at the same time.

I don't know how people found time to sleep!



TAKE ADVANTAGE OF D-TIPS LARGE DATABASE OF MODE \$06 INFORMATION

- [-] Ford
 - 96
 - 97
 - 98
 - 99
 - 2000
 - 2001
 - 2002
 - 2003
 - 2004
 - 2005
- [-] GM
- [-] Honda
- [-] Toyota
- [-] Chrysler
 - 1996
 - 1997
 - 1998
 - 1999
 - 2000
 - 2001
 - 2002
 - 2003
 - 2004
 - 2005
 - 2006
 - 2007

Our friends at www.D-Tips.com have been working on an extensive Mode \$06 database.

This database is still under construction, but already contains a large quantity of useful information.

Manufactures currently covered include: Ford, General Motors, Honda, Toyota and Chrysler. Mitsubishi and Hyundai will be added in the near future. CAN and non-CAN vehicles are both included.

Not only does the database tell you what each TID and CID are, but it goes into detail. Translated values, descriptions of tests and on-line conversion calculators are just the beginning.

Some entries include complete articles detailing individual component

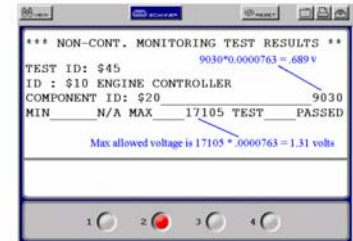
tests. The gray area of what was initially intended to be engineering data is taken away.

Whether you are a Mode \$06 expert, or this is the first time you have heard of Mode \$06, there is a wealth valuable information here. Our friend Rick has taken the time to spell out all of the details involved with Mode \$06, so please use D-Tips to your advantage.

CID: \$20
Description: Delta pressure for stuck open EGR
Units: volts
Conversion:

Notes: This monitor is checking the EGR valve at idle with no EGR commanded. If the test fails, it means that the EGR is stuck open or the DPFE sensor is reporting as if the EGR were stuck open. The fault is usually a DPFE sensor and not a stuck open valve, but not always. For more information on this TID, read the article linked below.

In the example below, the max allowed DPFE voltage is 1.31 volts. We get this number by multiplying 17,105 times the conversion formula of .0000763 to get volts. This vehicle had a DPFE voltage of .689 volts at idle with no EGR flow.



In the next example, the DPFE sensor shows a value of 20214 which translates to 2 volts at idle. This could be caused by a stuck open EGR valve, a leaking EGR vacuum solenoid, or a bad DPFE sensor.

You can explore a portion of D-Tips for free any time. However, access is limited to non-registered users. If you would like to see all of the information that D-Tips has to offer, use the **promo code SB42** to get one month **FREE**.

Hey, if someone takes the time to compile this much information on any topic, isn't it worth a look?

VOLUMETRIC EFFICIENCY CALCULATIONS: REPAIR VERIFICATION

Volumetric efficiency is a useful tool for diagnostics if you know how to use it.

Even if you are not familiar with its diagnostic capabilities, pre and post repair VE measurements can quickly and easily verify successful repairs.

Yes, I prefer that you explore, and use, VE to diagnose issues, but repair verification is a start. Let's apply this concept...

A vehicle with a lack of power complaint is taken on a test drive. A scan

tool snapshot is taken during the drive. Crunching numbers from the test drive equate to a VE of 65%. Bad by anyone's standards.

Using whatever method you choose, you determine that the catalyst is plugged. After replacing the catalyst you take a test drive to verify your repair.

Plugging your numbers into the same calculator you arrive at a VE of 81%.

Did you solve the driveability problem?

Yes.

Can you confirm an improvement? Yes.

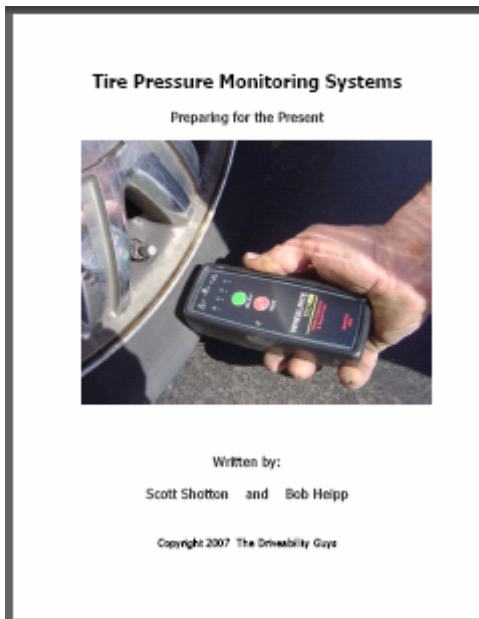
VE has been a tool used by racers for decades. Carburetor choice for performance vehicles is often based on this calculation.

There are many VE calculators available today. Visit www.driveabilityguys.com and click the **DECS** button to read about the software we use for VE.

VOLUMETRIC EFFICIENCY / FUEL REQUIREMENT CALCULATION

Displacement	<input type="text" value="3.8"/>	Liters	<input type="button" value="Calculate"/>	Volumetric Efficiency	85%
RPM	<input type="text" value="4200"/>			Max. Air Flow	163 GPS 22 Lb/M 282 CFM
MAF	<input type="text" value="138"/>	GPS		Fuel Vol. Req. @ Stoich	0.24 Gal/M 0.92 L/M
Fuel type	<input type="text" value="Gasoline (14.7 : 1)"/>			Fuel Vol. Req. @ Stoich + 20%	0.29 Gal/M 1.11 L/M

TPMS BOOK AVAILABLE FROM AES SOON!



Overview

The Driveability Guys, Scott Shotton and Bob Heipp, take the information presented in their well received TPMS seminar and offer it in book form.

Tire Pressure Monitoring Systems... Preparing for the Present. Weather you are a technician, service writer or shop owner, this book covers all of the information you will need to understand this technology and effectively service these systems in your shop.

What is TPMS and Why—An overview of the history of TPMS, the laws that govern its 2008 model year mandate. Statistical reasons for its introduction, and more.

Indirect TPMS systems—A complete breakdown of how indirect systems work and some of its disadvantages.

Direct TPMS systems—An overview of how direct TPMS works and a breakdown of the components involved, including a complete discussion on the different types of sensors.

Servicing Direct TPMS systems—This section covers where to find the service information, pages of information on special service tools and tips for sensor/tire replacement to help avoid sensor damage.

Other Tire Technologies... Present and Future—A look at some of the new technologies that are here now or potentially just over the horizon.

Service Writer Education—A section devoted completely to service writers specifically aimed at a successful service experience for your customer starting with the appointment process.

Direct TPMS Quick Reference—A quick reference of vehicles, prior to the 2008 model year, that could be equipped with direct TPMS. This information is very valuable, and easily accessed, during an initial service consultation.

WATCH FOR IT ON WWW.AESWAVE.COM.

SERVICE OR DIS-SERVICE

I was reading the Industry Issues Forum on iATN and ran across a post that talked about the ethics of just clearing codes and sending a customer on their way. This got me thinking on the subject and how I've seen it handled at different shops. More specifically, do their methods make both ethical and business sense?

Let's look at an example. A customer comes to your shop and says that their MIL is on and can you check it out? The service writer goes out to the vehicle and hooks up a code reader, retrieves and clears the trouble codes. From this point I have seen two scenarios: the customer will be sent on their way or the service writer notes the code on the work order and hands it to a technician. In either case, does this practice make sense?

If the MIL was on it is pretty safe to

say the vehicle has a problem, so why turn it away? If the vehicle is left for testing, and the codes are cleared, what does the technician have to work with? It is obvious that the codes are gone, but what about freeze frames, misfire counters and other information used during diagnostics? Do the actions in this example make ethical or business sense?

A shop is there to make money and provide a service. Was the customer in question provided with a service or dis-service? Was the shop's income potential effected by these practices? What about the relationship between shop and customer?

I believe the correct way to approach this situation is to educate the customer about the MIL, schedule the vehicle for service, leave the information in the PCM for the technician and get the vehicle fixed.



Maybe that code reader belongs in the circular file. I'll let you make up your own mind on that one.

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JUST FOR FUN... ARE INTAKES SUPPOSED TO EXPLODE?



Vehicle in question: 2001 Ford Escape. Complaint: "I cranked the car over, heard a loud boom, and white smoke billowed from under my hood." Problem: an explosion inside the plastic plenum blew it to pieces. The downward force from the underside of the plenum broke two of the ignition coils. The cause was never found. A new intake got the truck running.

Secondary problem: This 70 year old lady is probably going to wince at every start up for the rest of her life.

