1

Your Instructor For This Webinar

- National Trainer, ASE World Class, Master Auto, Truck, School Bus, L1, L3, CNG
- ATTP Master Instructor, New York State, CT and New Jersey
- STS (Service Technician Society) 2003 President
- TST (Technicians Service Training) Founder and President
- Author / Co Author/ Technical adviser on 25 plus books including
- OBD II and Mode 6, and Understanding and Diagnosing Hybrid Vehicles
- Published articles for multiple newsletters, and magazines
- Picked as one of the Top Instructors in the country by EPA & SAE
- Numerous Radio, TV, Internet, and SAE Video appearances
- PTEN, Motor Age and TST Webcast Instructor - Dorman Training Director
- Motor Magazine Top 20 award winner
- Provider of OBD II Training for 14 states, Ontario Canada and the US EPA
- Guest speaker at SAE Congress, IM Solutions and Clean Air Conference

"G" Jerry Truglia

gtruglia@dormanproducts.com

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2

RevUp - Smarter Solutions for Faster Repairs

Join this in-person training hosted by Dorman Training Center and Motor Age Training—a full-day event designed to sharpen your diagnostic skills and deepen your understanding of advanced vehicle repair. Learn directly from some of the automotive aftermarket's most respected instructors as they guide you through real-world scenarios, present detailed technical classes, and answer your questions on critical topics like air-fuel sensor testing, advanced electrical troubleshooting, and effective techniques for diagnosing complex vehicle issues.

EVENT CLASSES:
Attendees must choose one class to attend per session.

MORNING SESSION:
- **Upping Your Diagnostic Skills**
  Instructor: Jerry "G" Truglia
- **Diagnostic Strategies**
  Instructor: Pete Meier

AFTERNOON SESSION:
- **Building Your Diagnostic Worksheet**
  Instructor: Ken Zanders
- **Driving Down the Rabbit Hole**
  Instructor: Josh Weaver

SIGN UP TODAY!

Scan code or click here to register

For questions please contact:
DTC@DormanProducts.com or visit:
dormantrainingcenter.com

Location:
Automotive Training Center
900 Johnsville Blvd.
Warminster, PA 18974

Date:
September 20, 2025

- Morning Session:
  8:30 a.m. EST
- Afternoon Session:
  1:30 p.m. EST

Instructors:
Jerry "G" Truglia, Pete Meier,
Ken Zanders, Josh Weaver

Price: $149.95

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What Will Be Covered

Instructions For This Webinar

This seminar will be approx. 1 + hour long

- **All slides that are presented are in your handout and are numbered**
- **Have a pen or pencil and paper for notes**
- **Questions can be asked at anytime**

01 **In's & Out's Of R1234yf**

02 **One Technique You MUST Master**

03 **Misfire Story**

04 **Ford Dual Fuel Systems**

05 **GMC 6.0L Flex Fuel Issue**

05 **Questions & Answers**

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In's & Out's Of R1234yf

Ricardo is a seasoned automotive and diesel technician with over 22 years of experience in the industry. Throughout his career, Ricardo has honed his skills in various settings, including general workshops and dealer workshops for renowned brands such as Peugeot, Mini Cooper and Subaru.

Transitioning from hands-on work, Ricardo took on roles that have allowed him to share his expertise with others. He has served as a commercial training manager at retailers, where he imparted knowledge to technicians, purchasing managers, and territory managers. Additionally, Ricardo works as a sales representative at Dorman, which has allowed him to gain insight into the supplier side of the automotive business.

Over the years, Ricardo has collaborated with various suppliers, including Clarios, Quaker State, Innova, Alltrade Tools, FENCO, Motor Parts of America (MPA), BBB Industries, US Motor Works, Blue Magic, Perfection Clutch, Dayton Parts and ALLDATA. This extensive experience has given him a comprehensive understanding of the needs and requirements of vehicle owners, technicians, distributors
and suppliers.

Ricardo Mucharraz

rmucharraz@dormanproducts.com

All Ready to Make a Great A/C Repair?

Correct Tools & Training

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7

Protect Your Equipment & A/C System

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8

Equipment

AirSept
Dual Automatic Recycle Guard Sealant Remover

AirSept
AC Charge Guard
Keeps PAG Oil Out Of Hybrid / Electric Compressors

9

Protect Your Investment

10

Recover, Recycle & Recharge Machine

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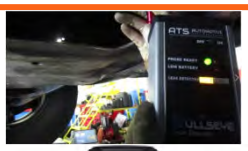
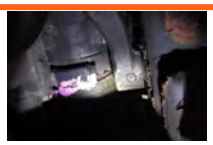
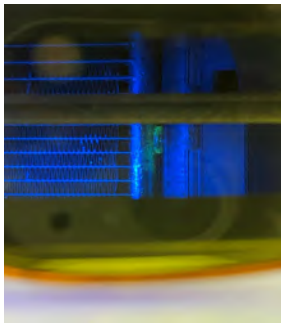
Best Way To Find A Leak







UVA 315 to 400 nm

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12

Import & A Law To Check R1234yf With A J2913 Leak Detector

Evaporator Leak Detection: A R1234yf Leak Detector J2913, Must be used and able to Detect a 0.1 oz or 3 gram leak per year set to its highest sensitive settings.

13

One Technique You MUST Master

Pete has been in the automotive industry for fifty years, starting as a service station attendant while in high school. He's earned ASE Master Automotive certification, wrenched on just about every conveyance that rolls on four and two wheels and runs on gasoline, taught in both private and public vocational schools, trained technicians at regional and national events and served as the technical editor for *Motor Age* magazine and later as the Director of Digital Content.

Pete started that magazine's YouTube channel and social media pages, a first for the industry. The channel hosts more than 600 videos now and exceeded 100,000 subscribers before his departure. He was among the first automotive repair instruction professionals, in partnership with TST, to offer training via live webinar and make online training as close to a hands-on experience as possible.

Pete's worked for dealerships, nationwide repair chains and small independents and is very familiar with the challenges of each of those distinct work environments. As our Training Manager, he's ready to share his knowledge with students to teach them the best and most efficient practices in automotive repair on current and future vehicles.

In Pete's words, his mission at the Dorman Training Center is simple: "Offer instruction that helps my fellow technicians continue to improve their standard of living."

Pete Meier

pmeier@dormanproducts.com

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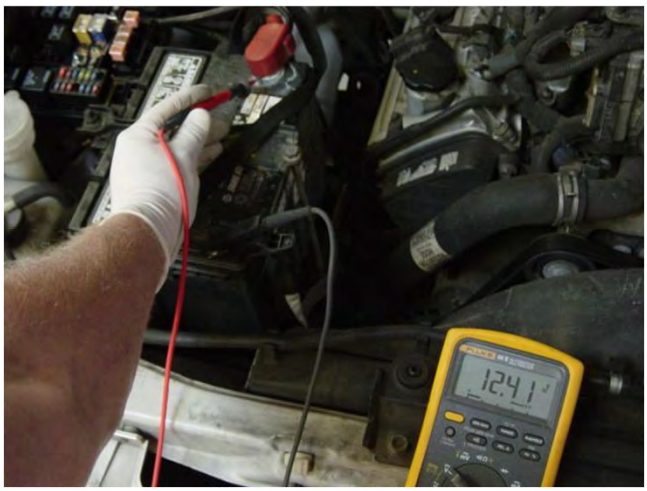
A New Way To Think Of Your Voltage Measurements



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The Black Lead Is NOT Ground!

The black lead of your meter in the "COM" port is your "reference lead" or ZERO point.

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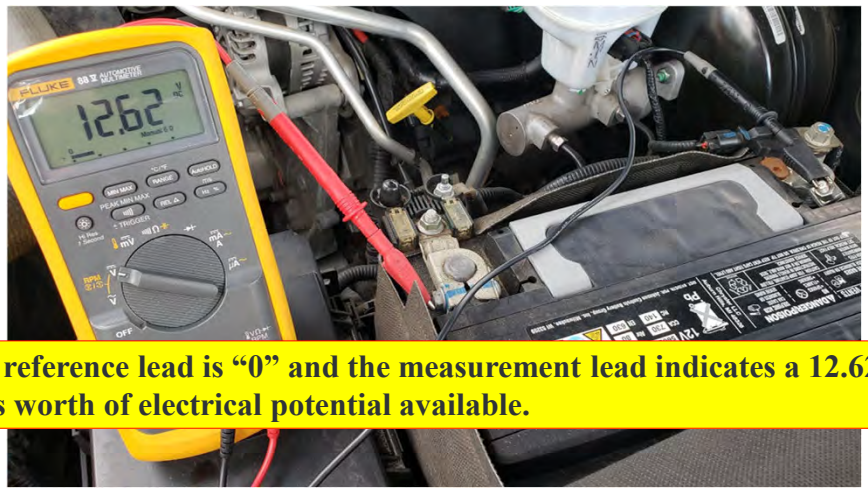
The Red Lead Is NOT Power!

The red lead of your meter in the "Volt" port is your "measurement lead".

17

Look At This Measurement From A Different Perspective



The reference lead is "0" and the measurement lead indicates a 12.62 volts worth of electrical potential available.

18

Troubleshooting Using Voltage Measurements

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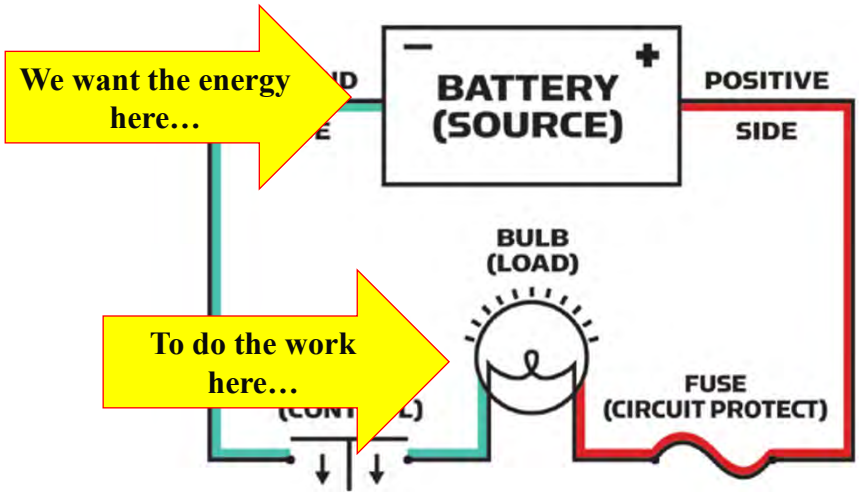
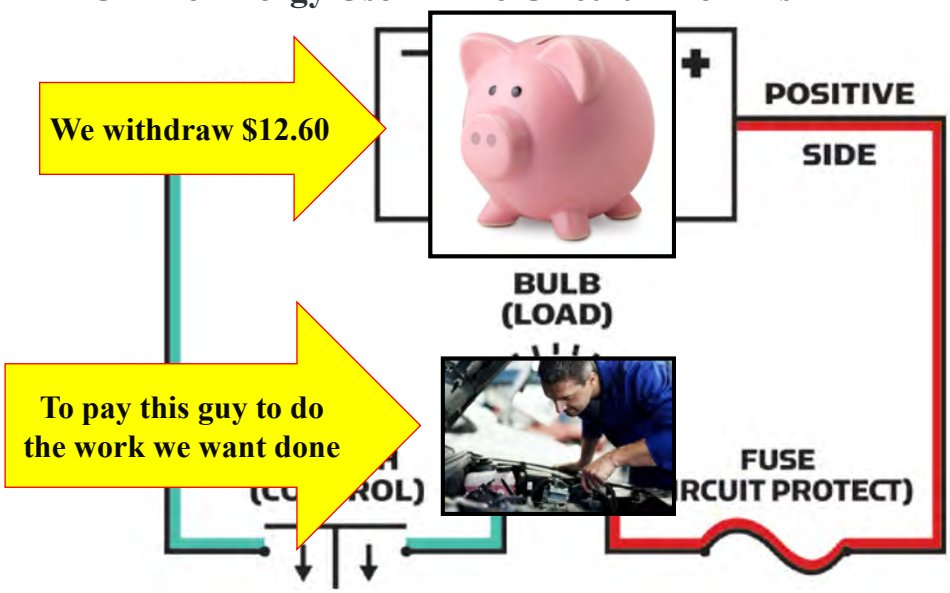
What The Electrical Potential Is Used For



20

Think Of The Energy Use In The Circuit Like This



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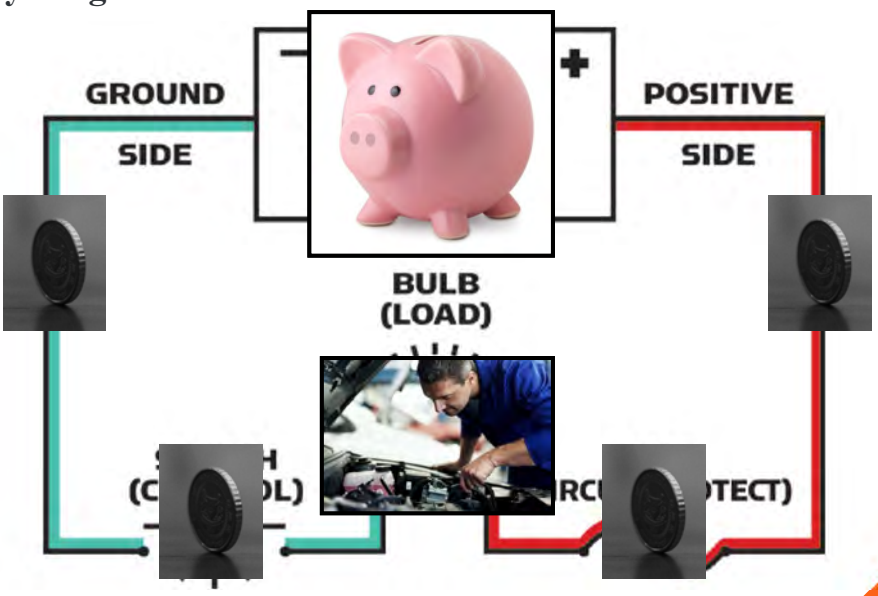
But Everything In The Circuit Has Resistance



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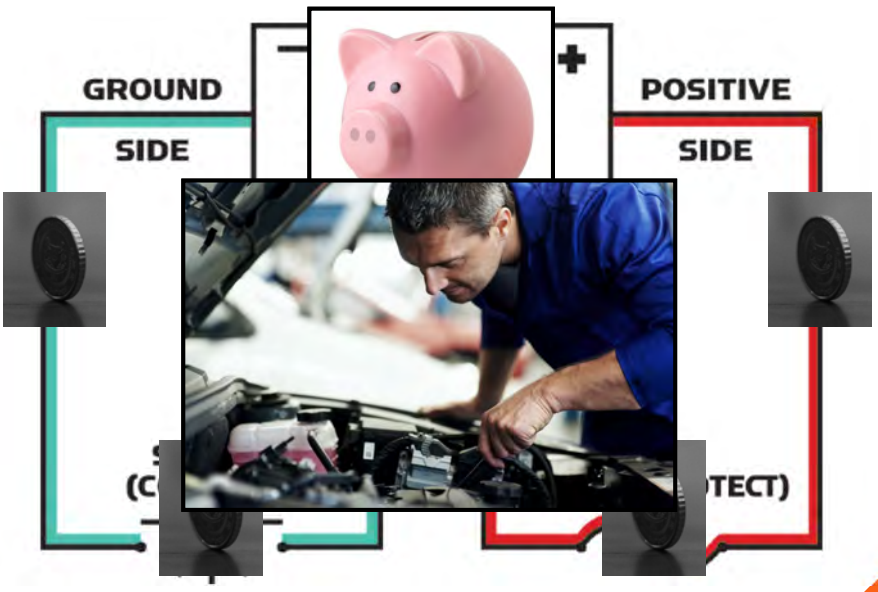
Kirchoff's Law



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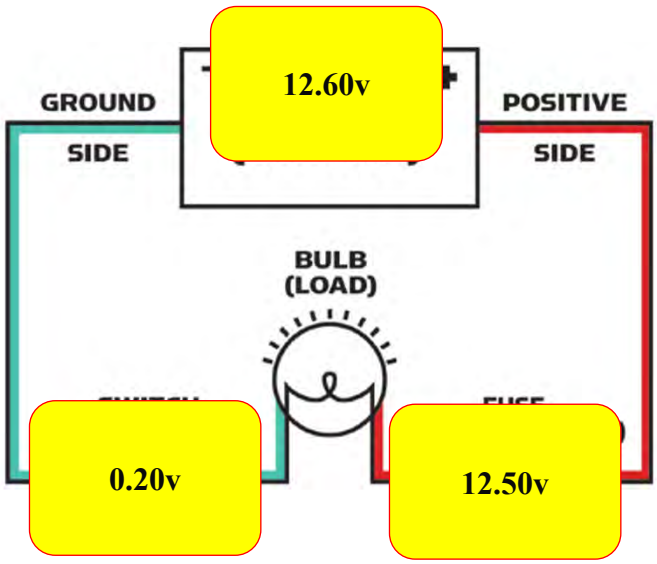
Now Think In Terms Of Voltage (Energy Available)



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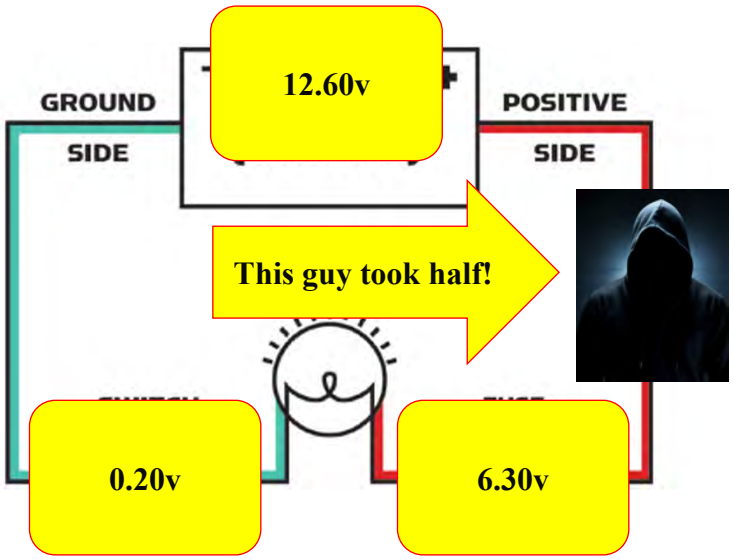
Problems Occur When Undetected Resistance Exists



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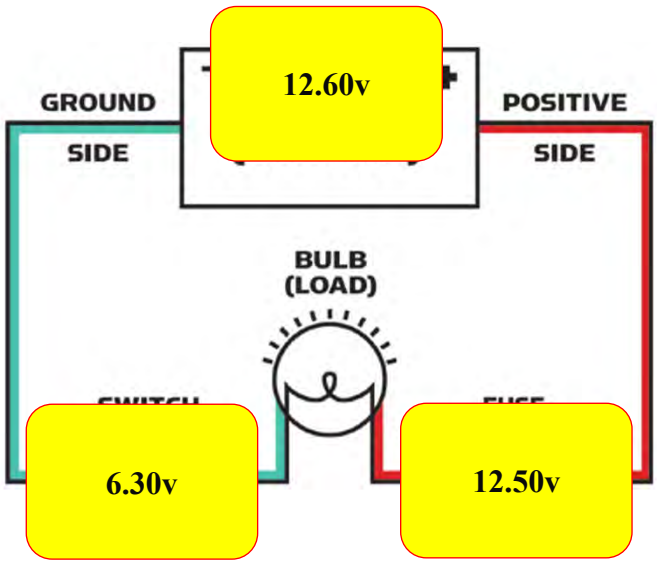
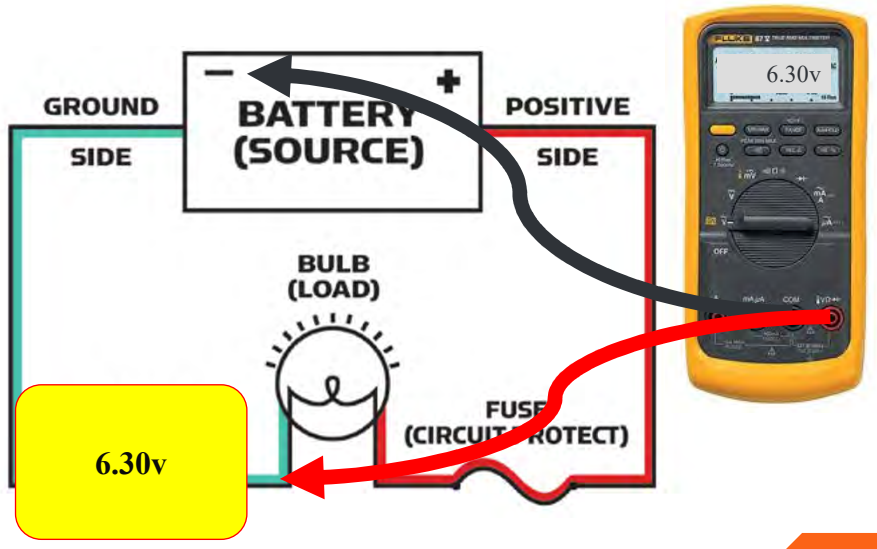
Electricity Flows In A Circle - At The Speed Of Light!



26

26

How Can You Measure Voltage If Both Leads Are On Ground?



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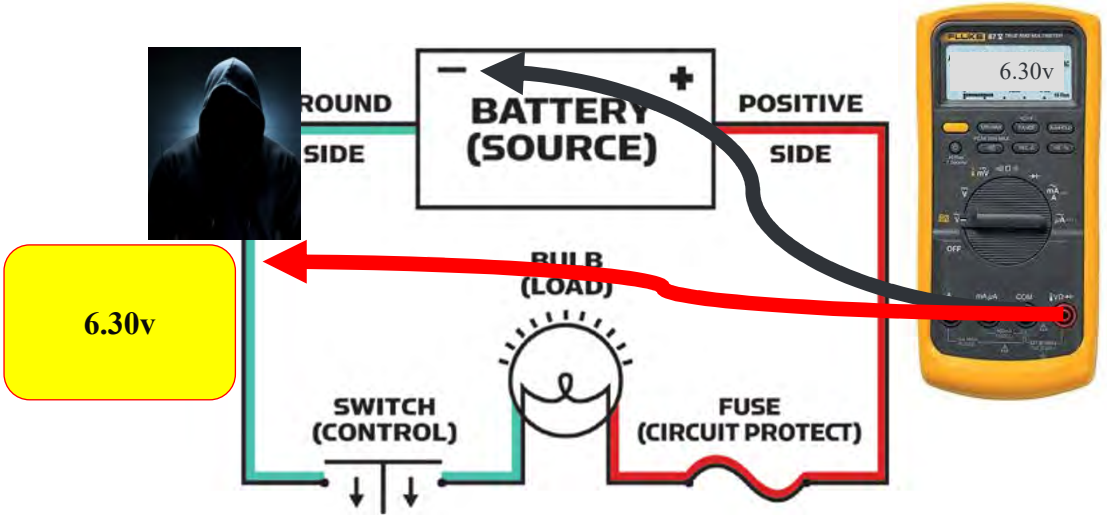
It's On The Feed Side Of The Unwanted Resistance!



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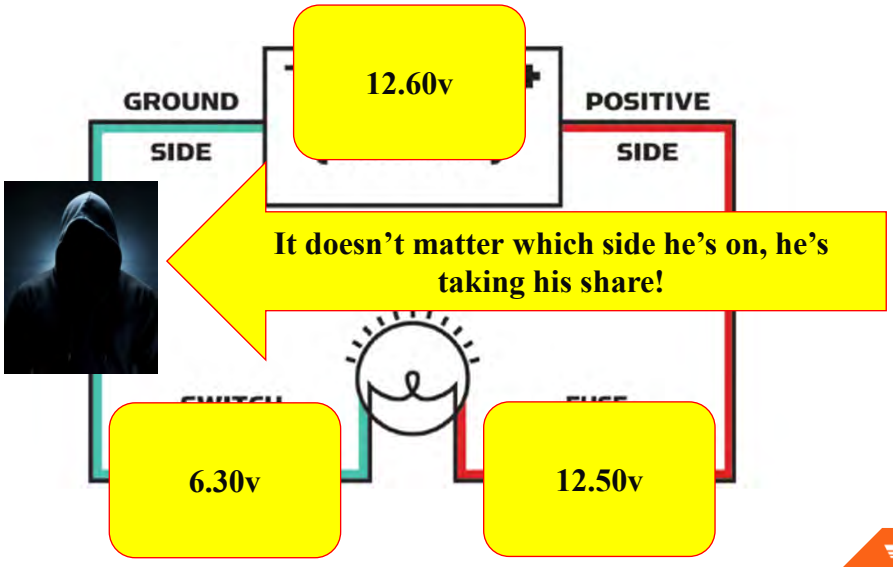
Electricity Flows In A Circle - At The Speed Of Light!



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Unwanted Circuit Resistance A Major Cause Of Electrical Faults

30

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A Misfire Story

- Experience and my education are both varied. The theoretical foundation includes Automotive Technology, Business Administration and Engineering. On the other hand, my experience is concentrated mostly in the automotive repair field in a variety of capacities. A three-year stint also included working as an Engineering Technician. Furthermore, I would classify my self as being first and foremost a teacher, more specifically a Teacher of Automotive Technicians.
- Having studied and instructed Automotive Technicians has enabled me to gain insights which I document and put together for them in the form of worksheets that complement the diagnostic process. It consists of a series of logical steps made in any diagnosis with a constant reinforcement of basic skills.
- I have accumulated a wealth of information, details and experience on the instruction of automotive repair technicians as related to the aftermarket repair industry. I have tested methods that increase their competency, not only in class but in the field as well. My approach promotes that they have the basic tools and information.

Kenneth Zanders

Kzanders@dormanproducts.com

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Engine Mechanical Analysis Worksheet

- Synch Signal (Determine a Good Reference)
- Relative Compression Test
- Cranking Vacuum Waveform
- Running Vacuum Waveform
- Cranking Exhaust Waveform
- Running Exhaust Waveform
- Camshaft Phasor Solenoid Test - VVT System Test
- Cam Crank Sensor Relationship

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2019 Hyundai Sonata - 2.4L

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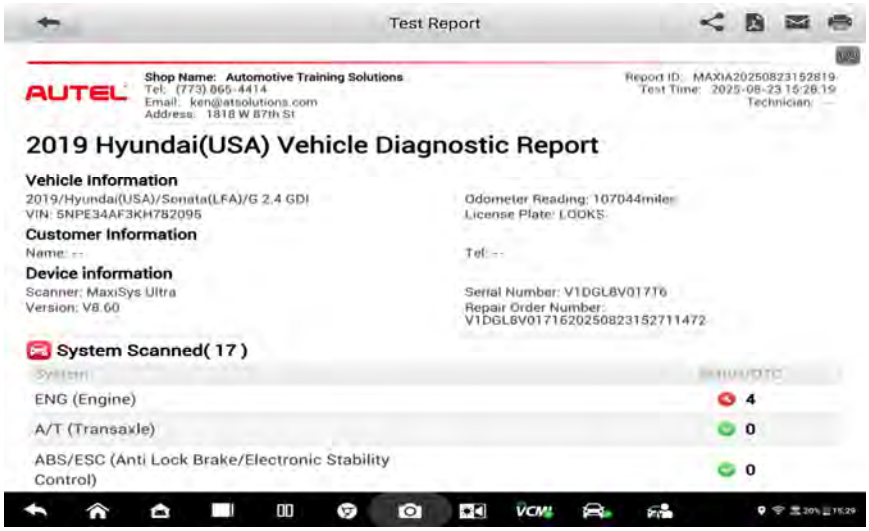
Vehicle Diagnostic Report



Test Report

AUTEL

Shop Name: Automotive Training Solutions
Tel: (773) 865-4414
Email: ken@atsolutions.com
Address: 1818 W 87th St

Report ID: MAXIA20250823152819
Test Time: 2025-08-23 15:28:19
Technician:

2019 Hyundai(USA) Vehicle Diagnostic Report

Vehicle Information
2019/Hyundai(USA)/Sonata(LFA)/G 2.4 GDI
VIN: 5NPE34AF3KH782095
Odometer Reading: 107044mile
License Plate: LOOKS

Customer Information
Name: --
Tel: --

Device information
Scanner: MaxiSys Ultra
Version: V8.60
Serial Number: V1DGL8V017T6
Repair Order Number:
V1DGL8V017162025082315271 1472

System Scanned(17)

System	Number of DTC
ENG (Engine)	4
A/T (Transaxle)	0
ABS/ESC (Anti Lock Brake/Electronic Stability Control)	0

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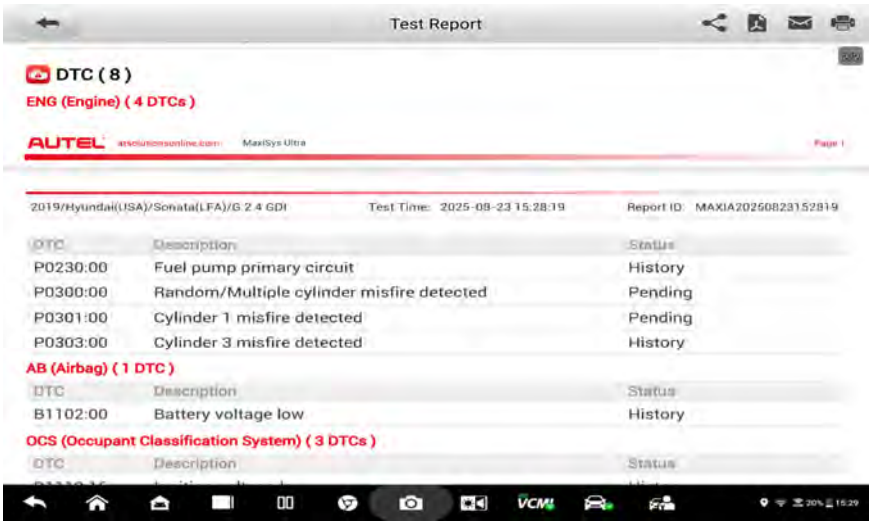
Vehicle Diagnostic Report



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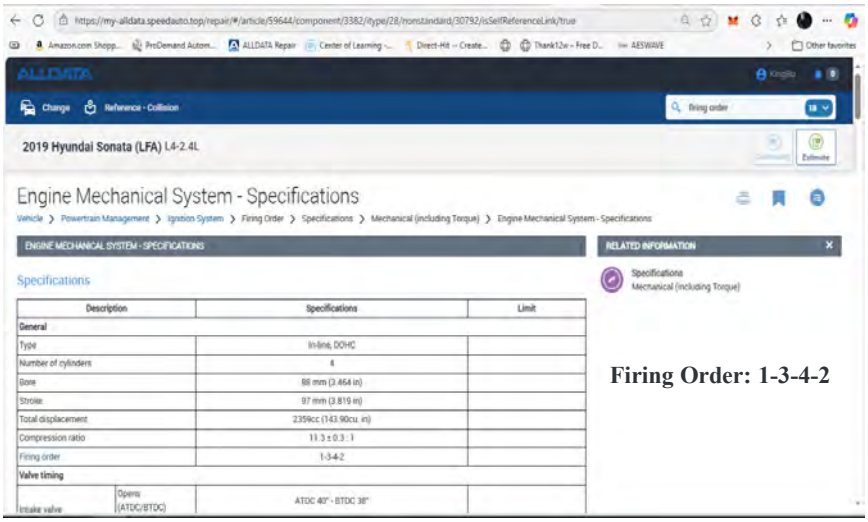
Engine Mechanical Specifications



Courtesy Of AllData

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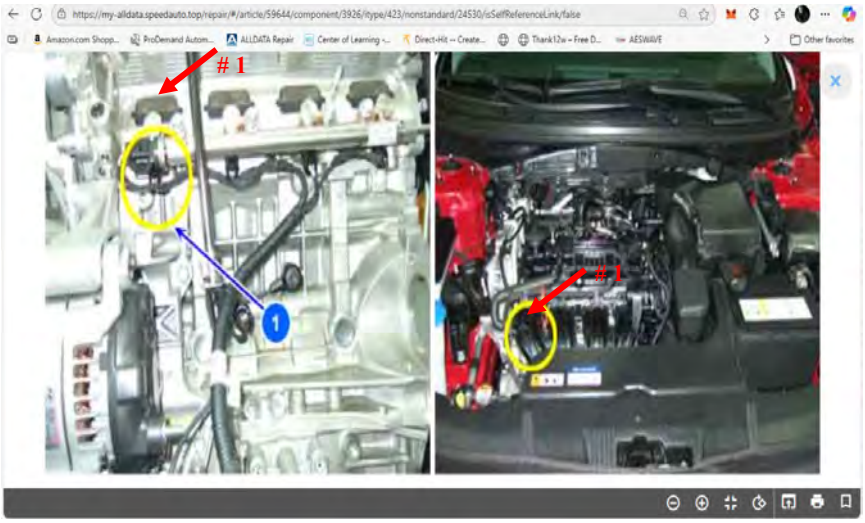
Cylinder # 1 Location



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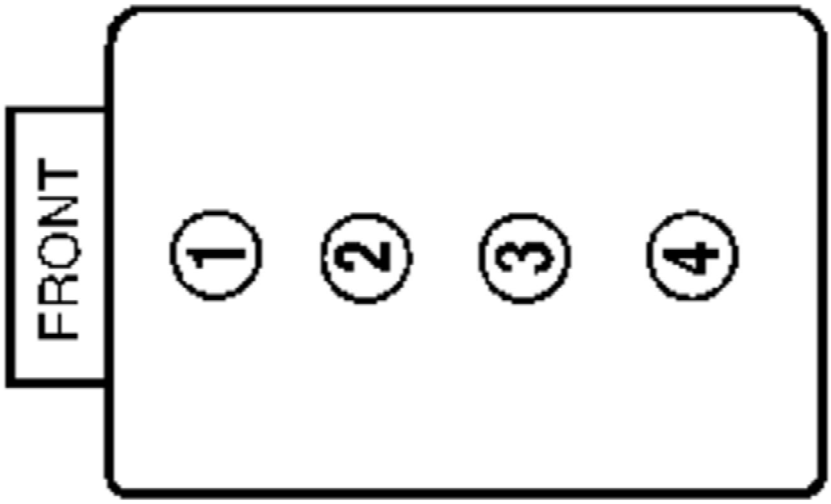
Engine Cylinder Configuration



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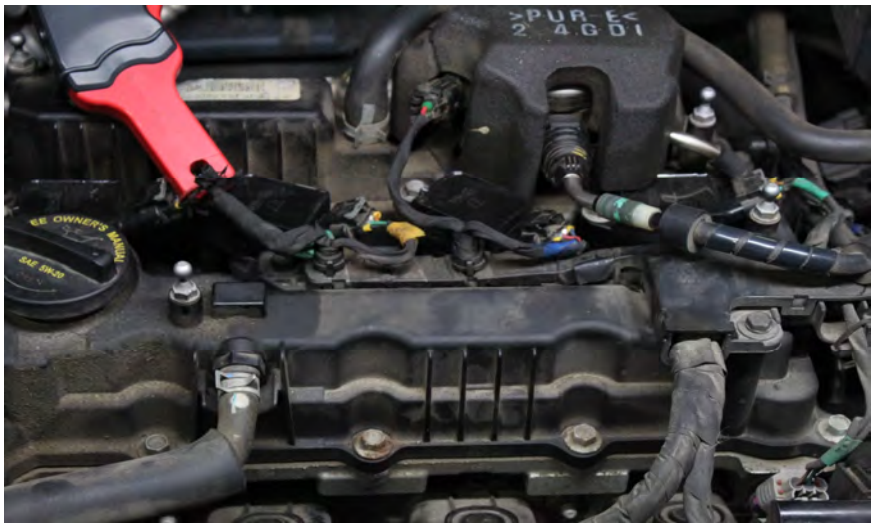
Current Probe Placed At Cylinder # 1



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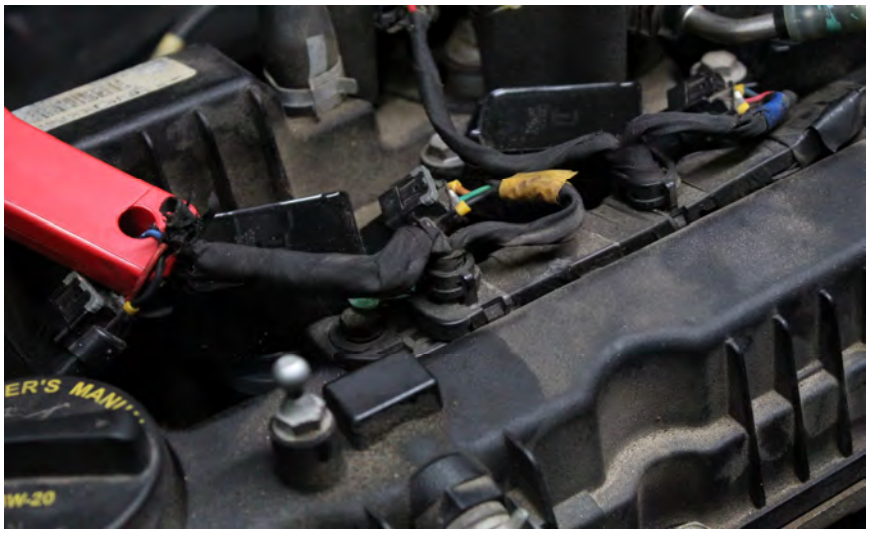
Current Probe Placed At Cylinder # 1



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Current Probe Placed At Cylinder # 1

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Current Probe Placed At Cylinder # 1

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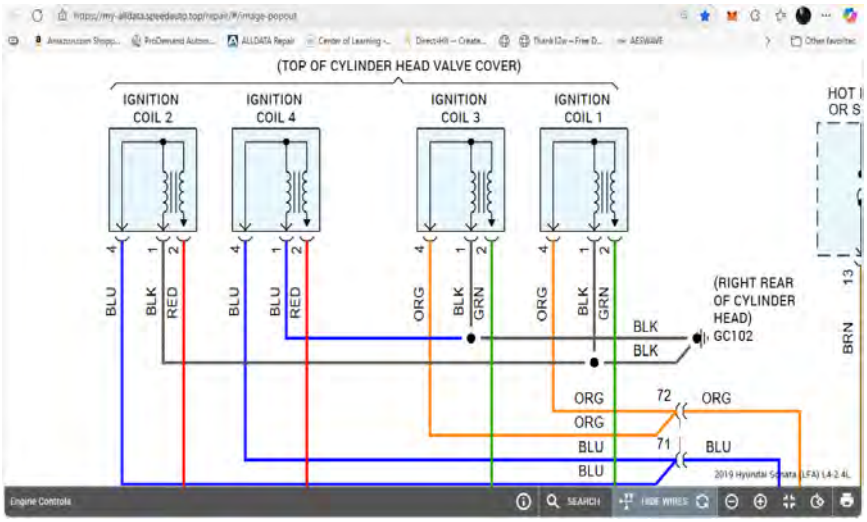
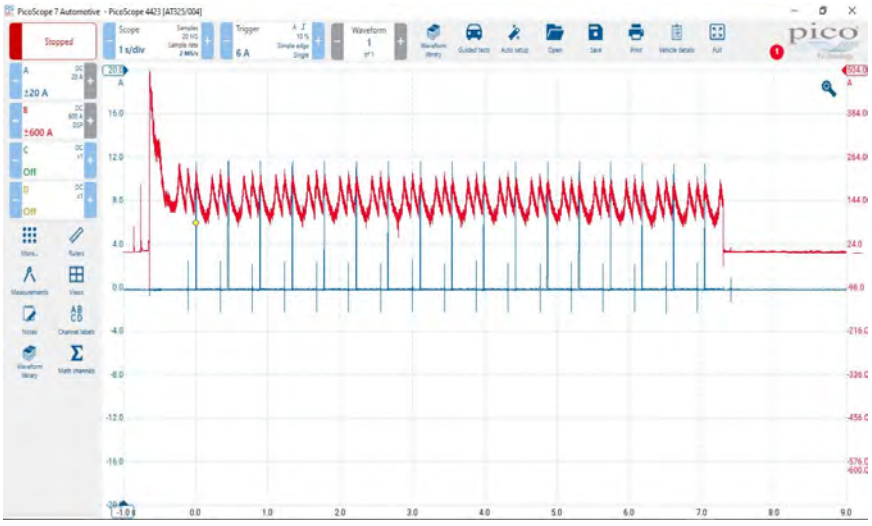
Wiring Diagram



Courtesy Of AllData

43

Relative Compression Test Performed



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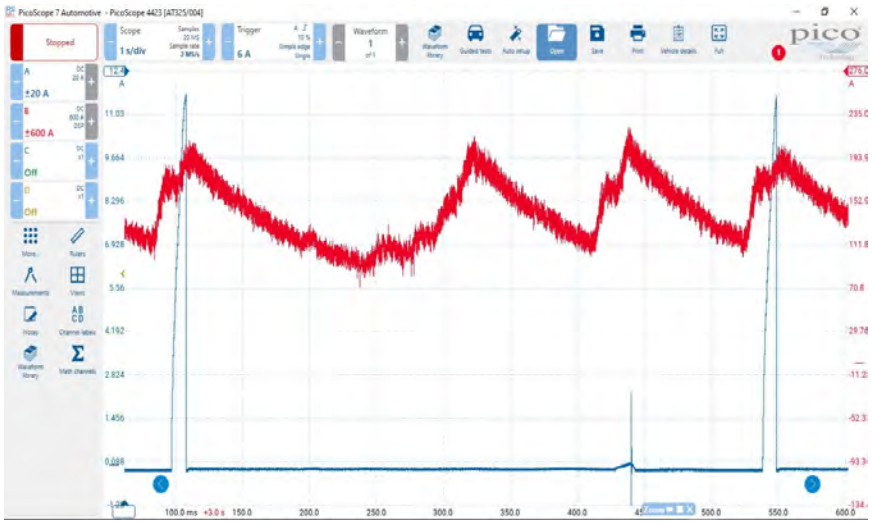

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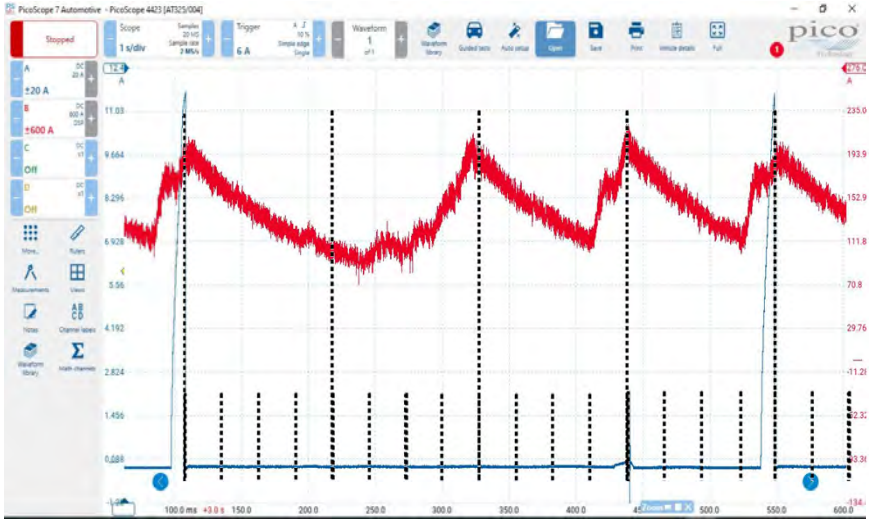
Relative Compression Test Performed



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Spark Plug Damage

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Spark Plug Damage

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Let's Take A Look Inside

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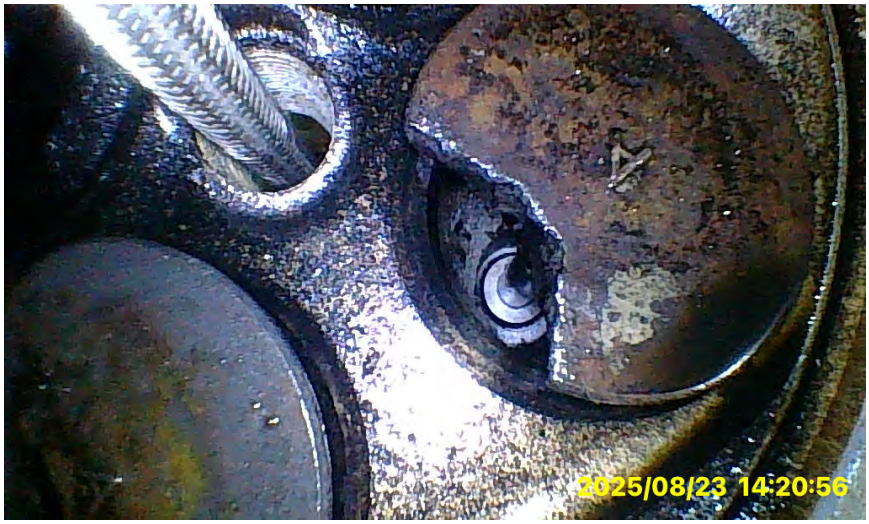
Valve Damage



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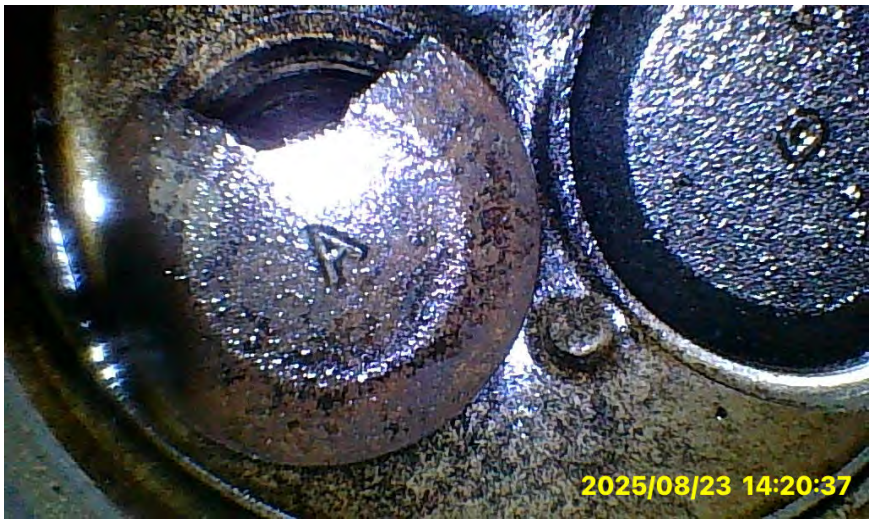
Valve Damage



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Ford Dual Fuel Systems

Josh has always been driven to learn new techniques to become a better technician, traveling around the USA to absorb all the training he could from the best instructors and professionals in the country. His focus now is on applying what he learned by sharing his knowledge both in the shop and in the training classroom.

Josh earned an associate degree in applied science in Automotive Technology in a program backed by Chrysler and General Motors. Josh is a certified Pennsylvania emissions and safety inspector, and also holds certifications for EPA 609, ASE L1 and L3.

While in college he worked for a Ford dealership, rounding out his exposure to all of the domestic manufacturers. After receiving his degree, he earned his ASE and Master Technician certifications at a Kia dealership. He was the lead technician at the dealership, which allowed him to see some of the most difficult and challenging vehicle issues that came through the shop. This allowed Josh to hone his diagnostic skills and share that expertise with fellow technicians.

After being in the dealership for many years, Josh became the service manager for a six-bay independent service center, which owned a six-bay collision center as well. Running shops of this size allowed him to see many different driveability issues, along with many electrical and programming issues.

Josh's passion for diagnostics led him to launch his own part-time mobile diagnostic business and develop and instruct some training classes for some of his local automotive technician association chapters. His goal is to help keep moving the industry forward and improving for the better, by helping technicians learn and grow.

Josh Weaver

jweaver2@dormanproducts.com

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Cold Start Emission Strategy

On a cold start, the system will start and run on both fuel systems. This is done for cold start emissions and to help light the catalytic converter faster. **PM is also highest on a cold start when using GDI.** PM tends to build up in GDI systems from cold pistons and cylinder surfaces, which hinders the evaporation of the fuel stock, causing soot to form after ignition. **A small amount of port injection is applied to help reduce PM emissions. This small amount of port fuel allows for wall wetting and better evaporation of the fuel mixing in the intake before it moves into the combustion chamber.**

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Cold Start Emission Strategy - Homogeneous Split Injection

For the first 50 seconds of engine run time, the ignition timing is retarded to -20 degrees. **Retarded ignition timing reduces the efficiency of the combustion chamber at the same time raises combustion gas temperature.** This results in hotter exhaust entering the catalytic converter, reducing the time it takes to light off.

The other strategy is by injecting fuel closer to top dead center compression. **This late injection time increases exhaust gas temperature.** This results in hotter exhaust entering the catalytic converter, reducing the time it takes to light it off. **Ford will inject fuel via the direct-injection system 240° before top dead center compression (on the intake stroke), and 30° BTDC compression.**

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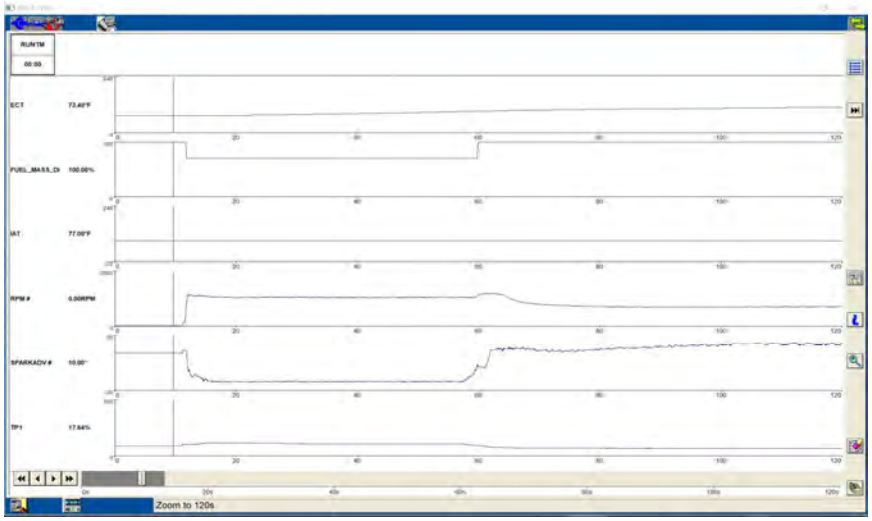
Overnight Cold Start - First



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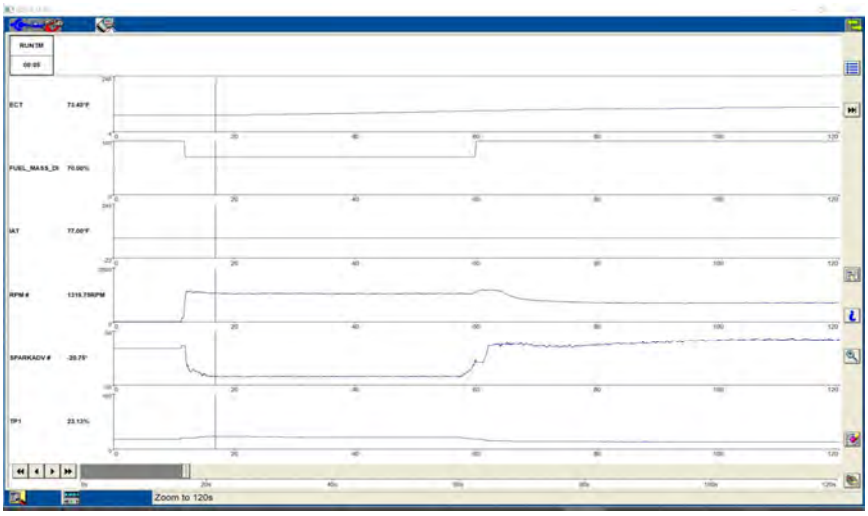
Cold Start Emission Strategy - 5 Seconds



Fuel_Mass_DI 70%, TP1 23.13%, Spark advance -15°, and 1319 RPM

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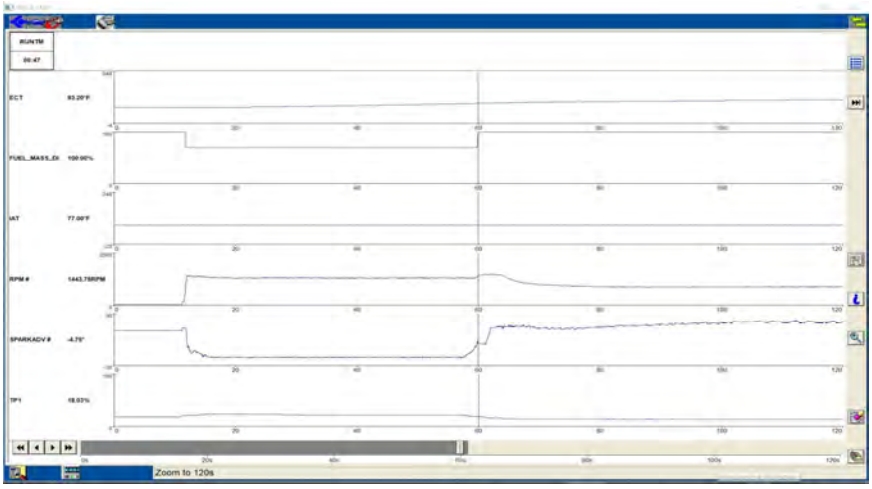
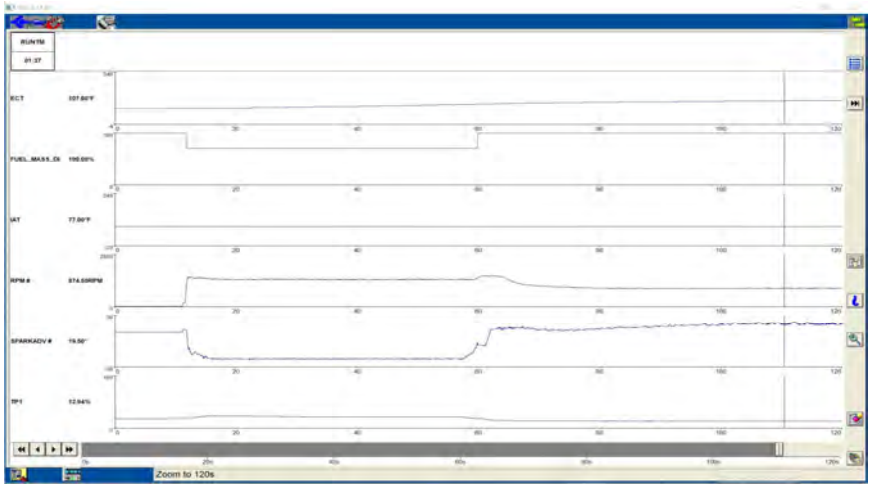
Cold Start Emission Strategy - 47 Seconds



Fuel_Mass_DI 100%, TP1 18%, Spark advance -4.75°, and 1443 RPM

57

Cold Start Emission Strategy - 01:37 Seconds



Fuel_Mass_DI 100%, TP1 12.94%, Spark advance 19.5°, and 874 RPM

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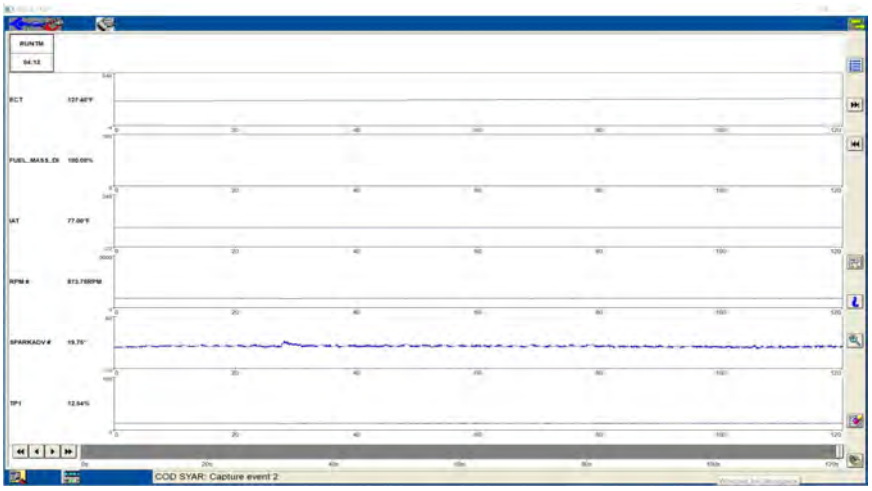
Cold Start Emission Strategy - 01:37 Seconds



Fuel_Mass_DI 100%, TP1 12.94%, Spark advance 19.7°, 873 RPM and **ECT 127.40°F**

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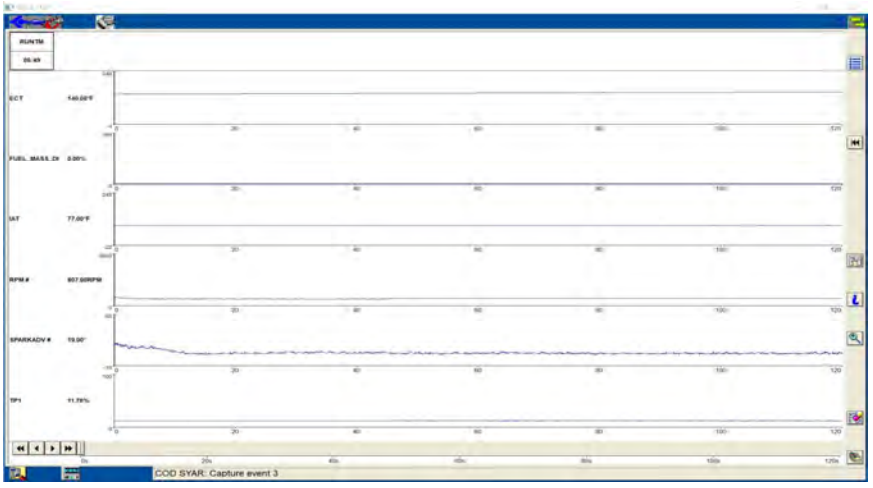
59

Cold Start Emission Strategy - 05:49 Seconds

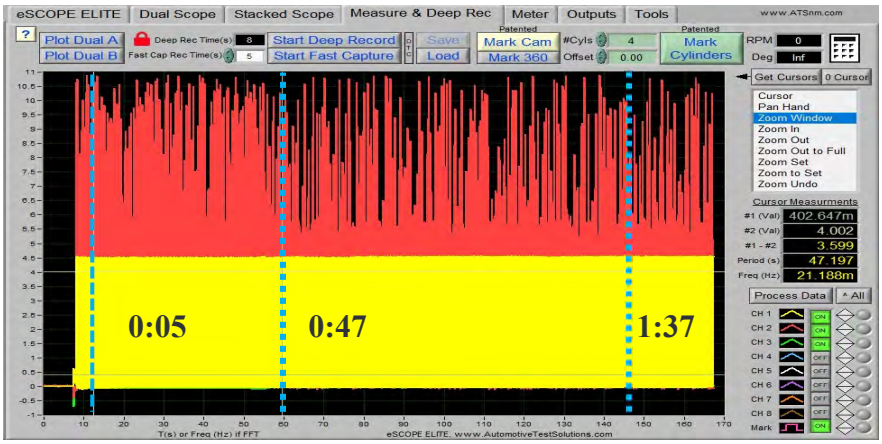


Fuel_Mass_DI 00%, TP1 12.94%, Spark advance 19.0°, 807 RPM and **ECT 140°F**

60

60

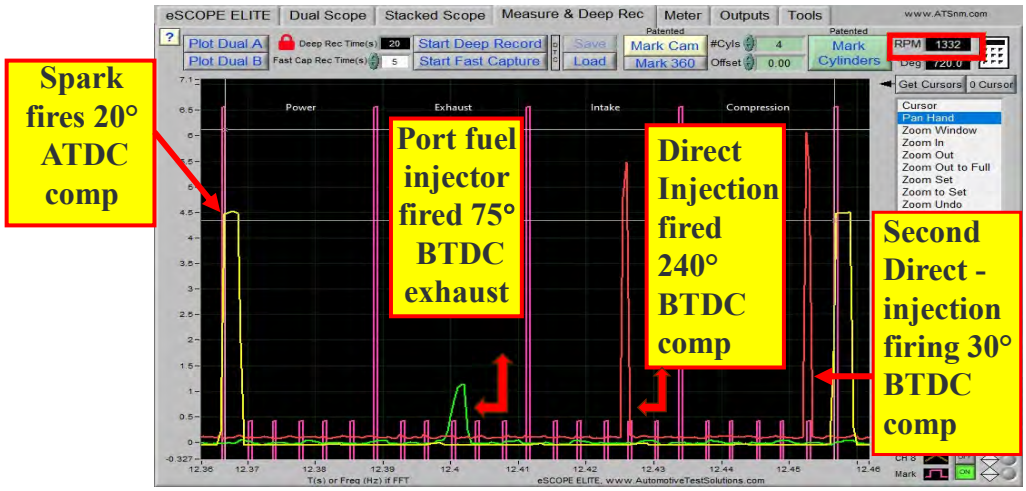
Overnight Cold Start - First 2.5 Minutes



While recording a cold start with Ford IDS, a recording was taken with the scope. The three blue time marks are stamped to match the time frame in the IDS slides.

61

Cold Start Emission Strategy - 5 seconds



62

Cold Start Emission Strategy - 47 Seconds

The vehicle is now delivering 100% of the fuel in direct-injection only mode. Catalyst preheating is now stopped.

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GMC 6.0L Flex Fuel Issue

Check Engine light and driveability problem. We first uncovered the following DTCs **P0101 Mass Air Performance, P0171, P0174 Bank 1 and 2 Lean Condition, P0172, P0175 Bank 1 and 2 Rich Condition.** Even after clearing the codes the PID data displayed Bank 1 STFT -14% and LTFT 32% and Bank 2 STFT -13% and LTFT 30% so you can see where the lean and rich codes were coming from.

Code	Description
	DTC Codes:
P0101	Mass or Volume Air Flow Circuit Range/Performance
P0171	System Too Lean Bank 1
P0172	System Too Rich Bank 1
C3401	Description not available
	No Pending Codes Present

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GMC 6.0L Flex Fuel Issue

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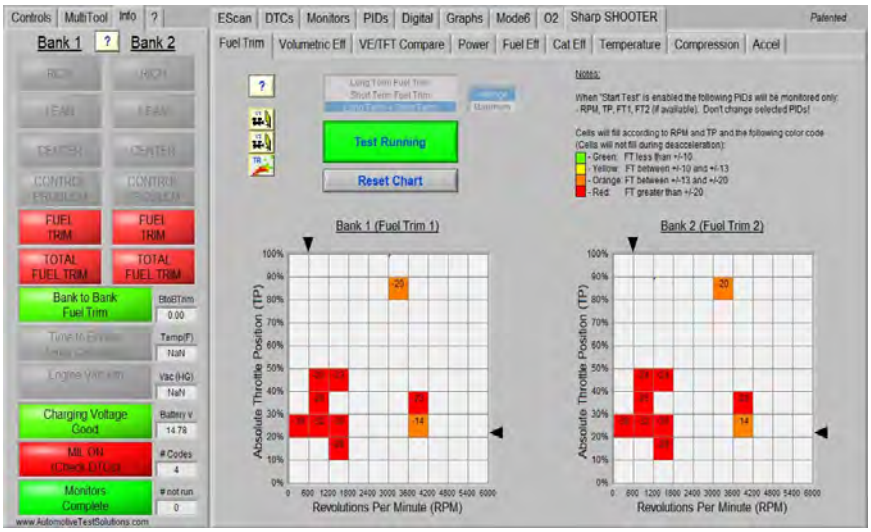
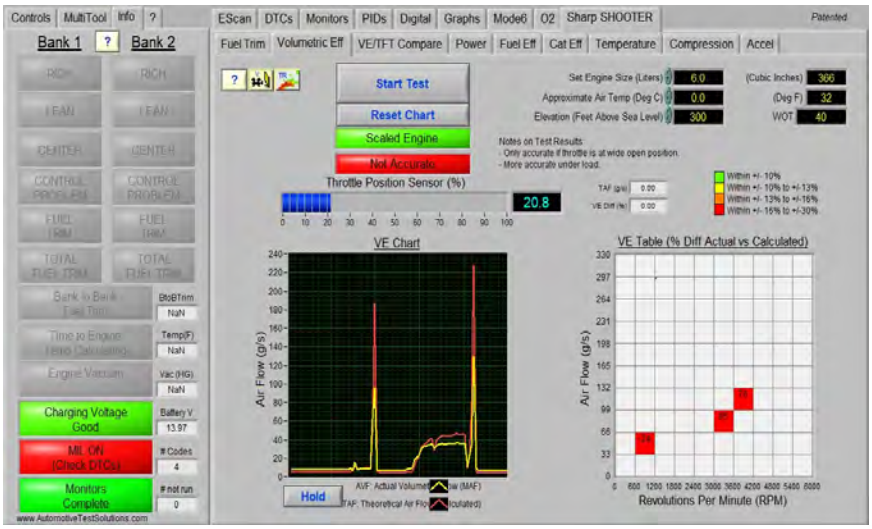
GMC 6.0L Flex Fuel Issue



66

GMC 6.0L Flex Fuel Issue



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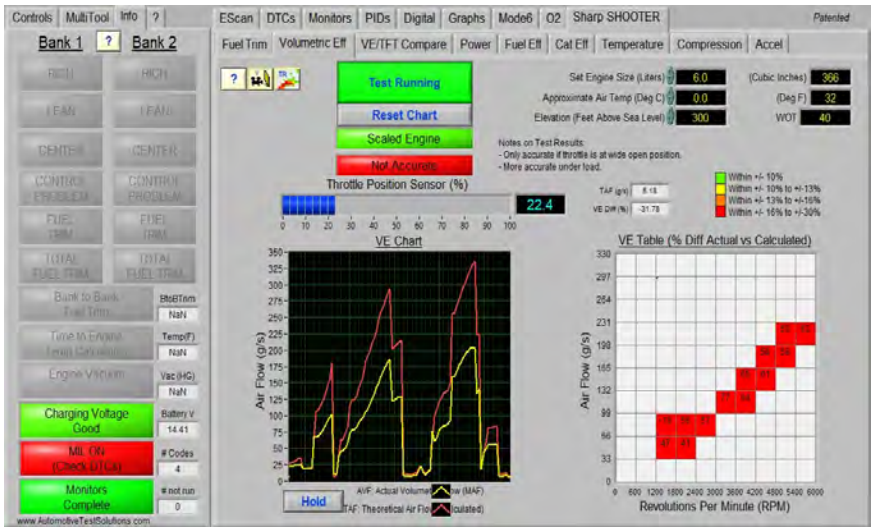
GMC 6.0L Flex Fuel Issue



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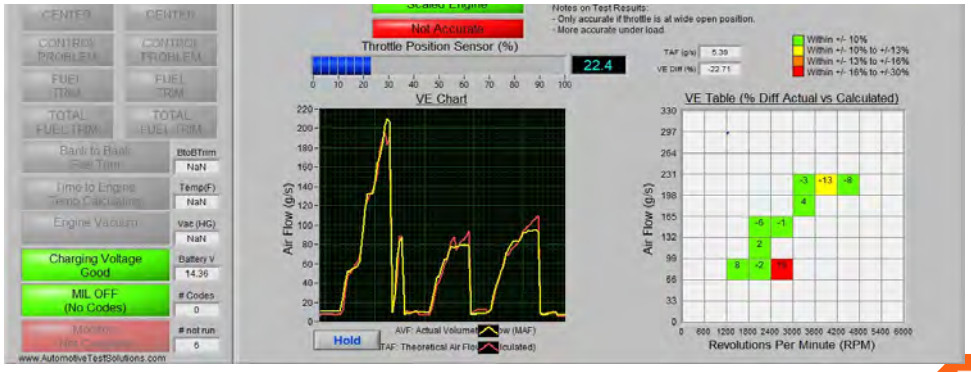
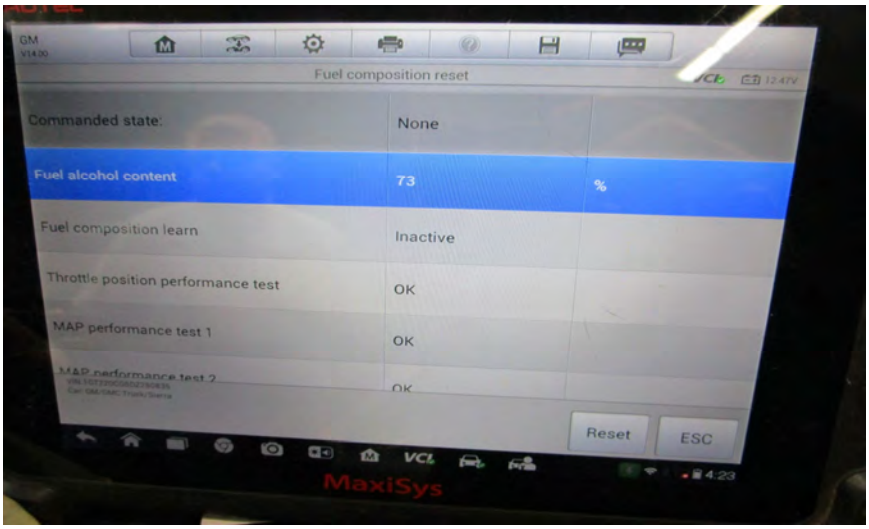
GMC 6.0L Flex Fuel Issue

VE (volumetric efficiency) test using the EScan to confirmed the P0101 DTC. The test was performed on the road and failed miserably. The recommendation was a new MAF sensor since the old one could not be cleaned and was so far out of specification. The results it PASSED!



69

GMC 6.0L Flex Fuel Issue



70

GMC 6.0L Flex Fuel Issue

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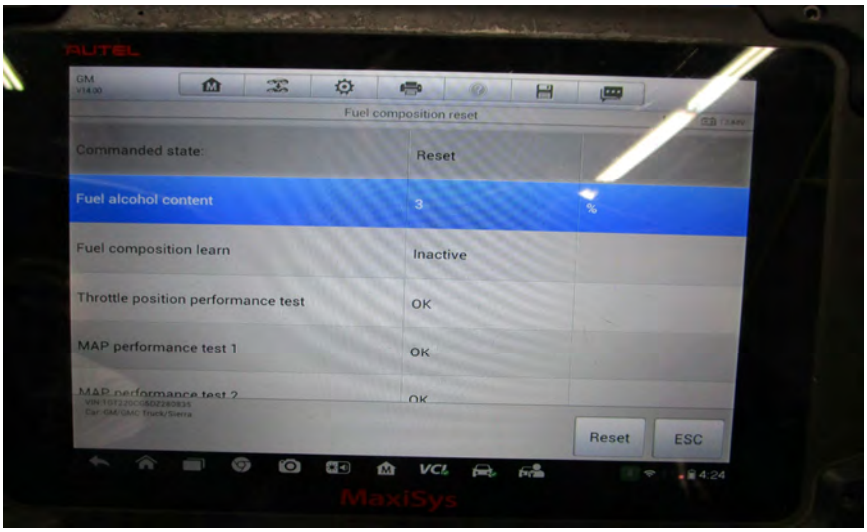
GMC 6.0L Flex Fuel Issue



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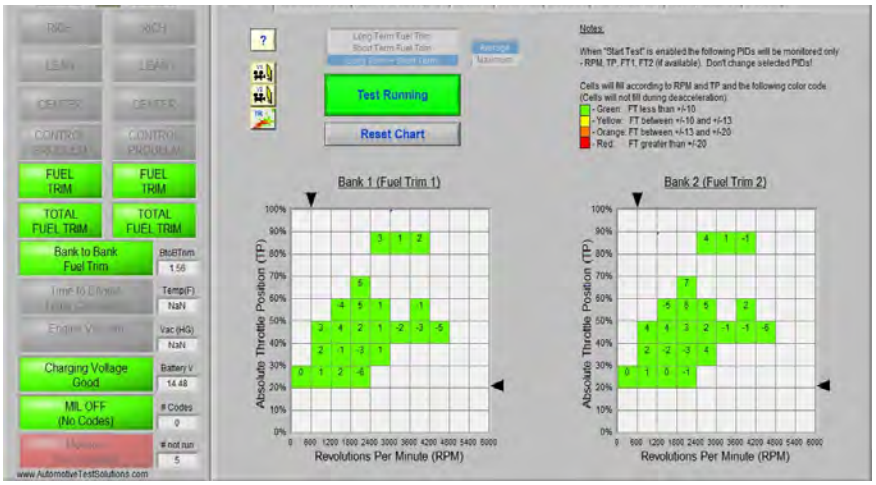
GMC 6.0L Flex Fuel Issue

After Fuel Trim Alcohol Reset



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