
TECHNICIAN
TRAINING
BY DORMAN PRODUCTS
DORMAN
Training Center
Presents:
"EVAP Leak Detection"

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DORMAN
Aftermarket Innovators

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Your Instructor For This Seminar

"G" Jerry Truglia

- **National Trainer, ASE World Class, Master Auto, Truck, School Bus, L1, L3, CNG and…**
- **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, MotorAge and TST Webcast Instructor**
- **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**

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EVAP Leak Detection

This Dorman Lunch and Learn will cover a quick review of the EVAP system and concentrate on how to find leaks in the EVAP system. Live demo.

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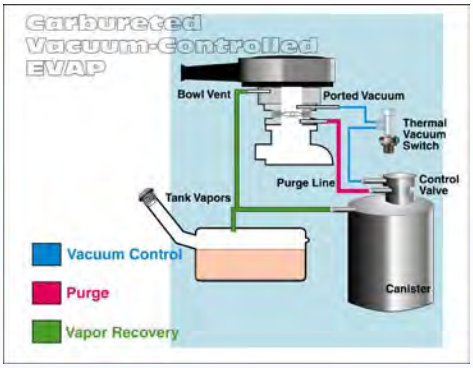
Introduced In The 1970's



Early canisters were equipped with a filter vent that was always open. As vapors were purged into the engine, fresh air was drawn into the canister.

A Thermal Vacuum Switch prevented purge in a cold engine.

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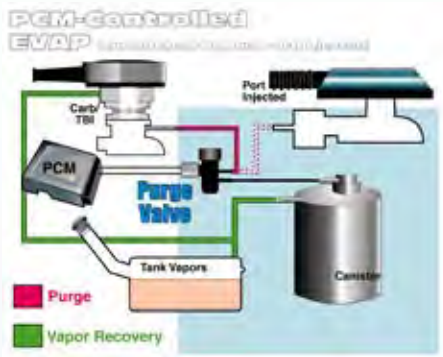
PCM Purge Control

In the 1980's, vehicles were equipped with Carburetors, Throttle Body Injection, and Port Injection.

During this time, vacuum controls gradually gave way to solenoid - operated Purge Valves, opened by an electrical control from the vehicle computer.

Electrical controls reduced the complexity of the system and improved its efficiency.



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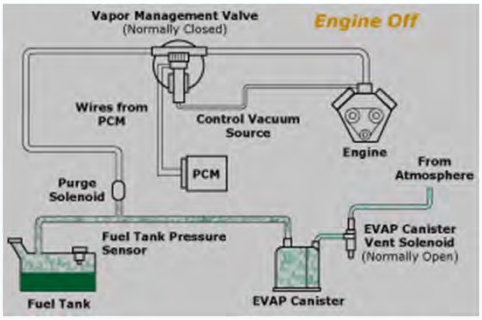
OBD II Enhanced EVAP

The demands placed on the EVAP system increase with OBD II.
They include:

- **Testing the operation of the Purge and Vent solenoid valves**
- **Testing purge flow**
- **Testing the entire system for vapor leaks as small as 0.010 in.**



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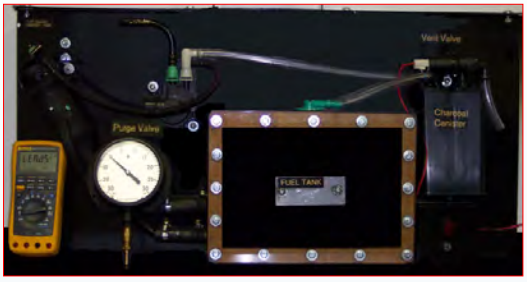
Evaporative System Components

1. **Canister Purge valve normally CLOSED**
2. **Canister**
3. **Fill neck and gas cap**
4. **Fuel Tank Pressure (FTP) and rollover valve**
5. **Fuel tank**
6. **Canister Vent valve normally OPEN**
7. **Vent line**
8. **Vapor line**
9. **Purge line**
10. **Service Schrader have REVERSED THREADS**



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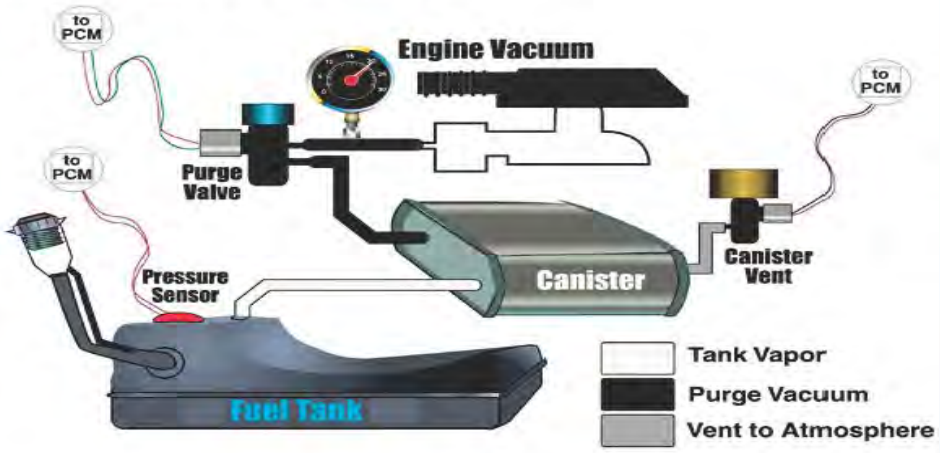
EVAP Vacuum Tests Simplified

- Vapor Management or Purge Control valve.
- Solenoid-operated canister vent, located right in the canister or in the canister vent line to atmosphere.
- Fuel tank pressure sensor.



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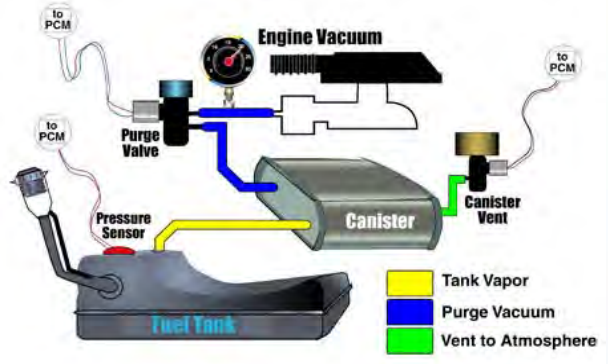
Monitoring Of Enhanced EVAP Systems

That Use Engine Vacuum To Test For Leaks



GM, Ford, and many Imports use this test strategy.

Here's what they have in common: Vapor Management or Purge Control valve, solenoid - operated canister vent, fuel tank pressure sensor.

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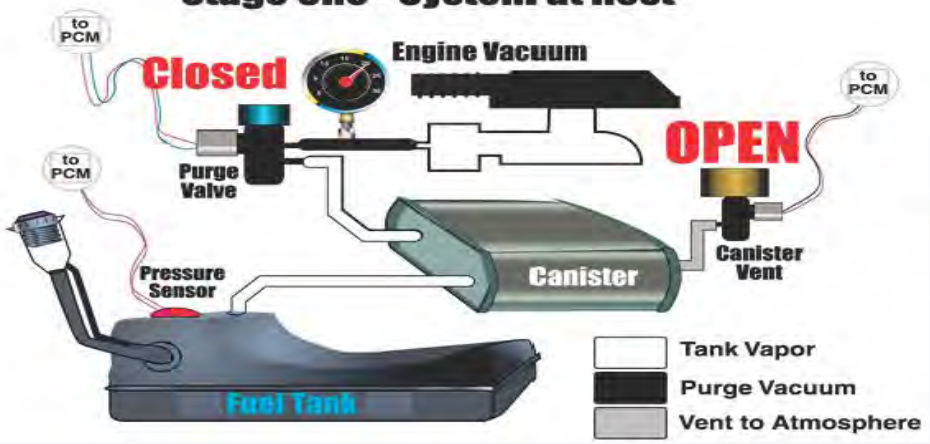
Vacuum Leak Detection Principles

Simple leak detection strategy has **three basic stages.**

1) **System at Rest** - Pressure Equalization
2) **Weak Vacuum Test** - Pull an Initial Vacuum
3) **Small Leak Test** - Hold Vacuum

Stage One - System at Rest



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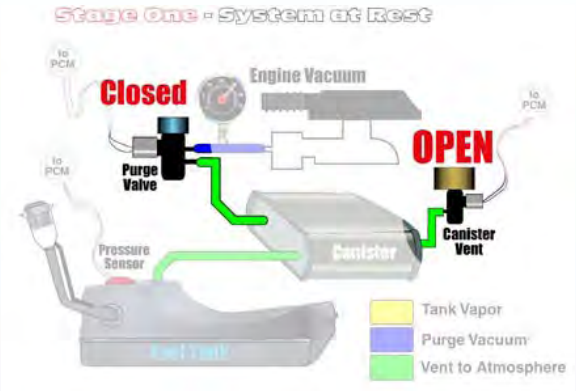
Step One - System at Rest - Pressure Equalization



In Step One, the EVAP system is at rest. In other words, the Purge Valve is closed and the Canister Vent Valve is open. This is the normal state for each valve, before the PCM activates them. With the Purge Valve closed, no engine vacuum can reach the canister and, with the Canister Vent open, any pressure or vacuum in the system equalizes with atmospheric pressure.

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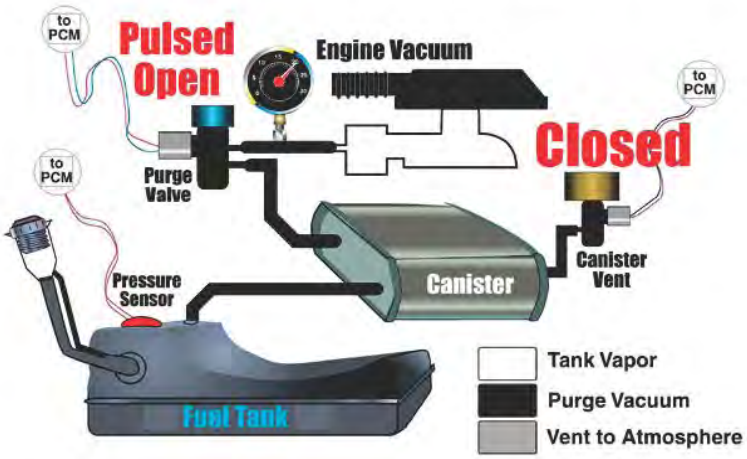
Vacuum Leak Detection Principles

Stage Two - Pull a Vacuum



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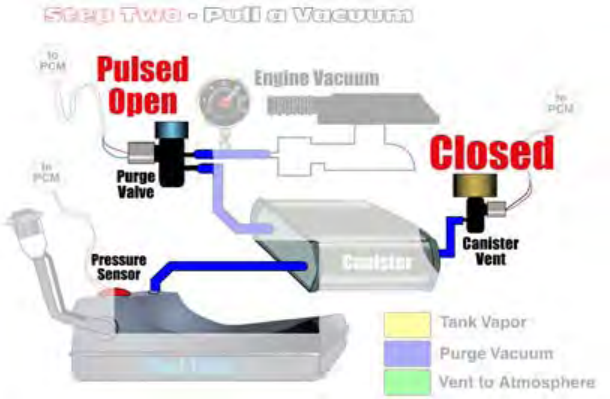
Step Two - Weak Vacuum Test



In the Step Two, the Purge Valve is opened by a pulsed signal from the PCM. Then, the Canister Vent is closed. Vacuum in the EVAP system should increase to about 6-8 inches of water if there are no large leaks. This is sometimes referred to as the Weak Vacuum Test. If the system cannot be drawn down to this level, a P0440 is stored.

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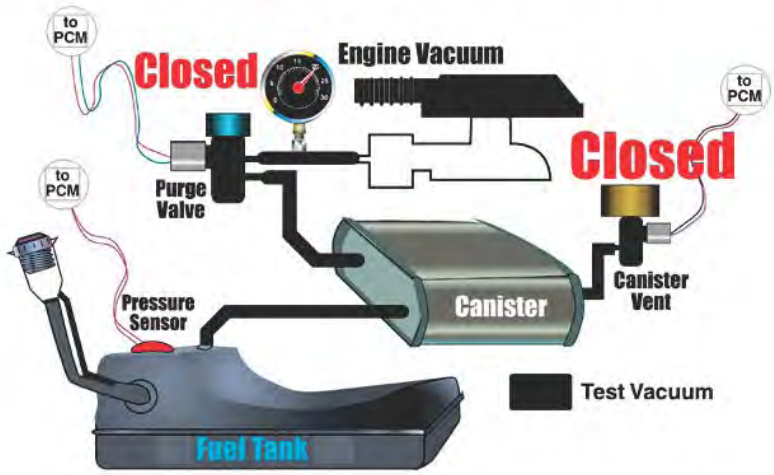
Vacuum Leak Detection Principles

Stage Three - Hold Vacuum



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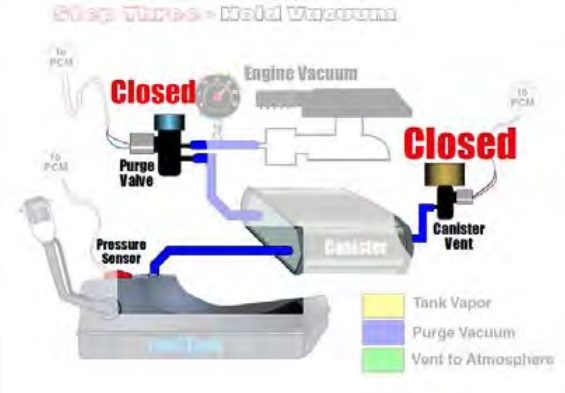
Step Three - Small Leak Test - Hold Vacuum



In the Step Three, the Purge Valve is closed and the Canister Vent remains closed. If there are no leaks, the vacuum generated inside the EVAP system should hold steady (some small amount of decay is allowed, however, and may be caused by increased vapor pressure, not a leak). If the vacuum does not hold within an acceptable range, a fault is recorded by the EVAP monitor.

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EVAP Diagnostic Tools

Note: Loss of 1 inch of pressure in 1 minute indicates a leak

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EVAP Smoke Machine

The smoke machine flow meter gauge ball is just above the limit - barely in the failing zone,

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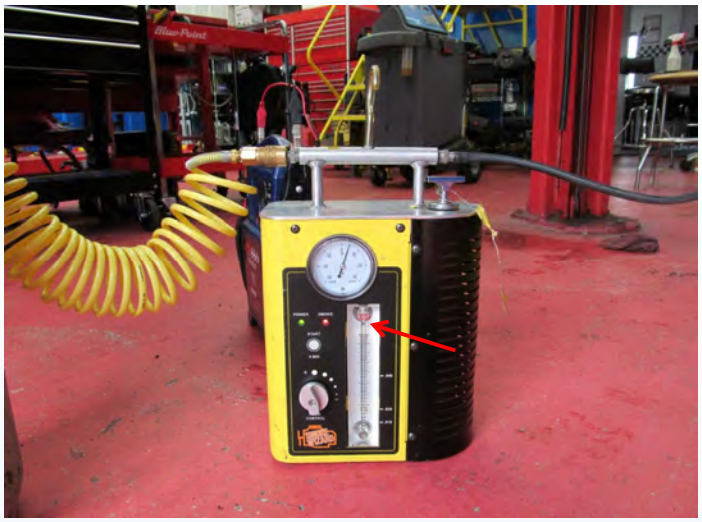
(Major EVAP Leak)



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(Major EVAP Leak)

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(Major EVAP Leak)

This EVAP problem was man made since someone lifted the vehicle and missed the lifting point, resulting in a cracked canister. **Fix: replaced the canister**

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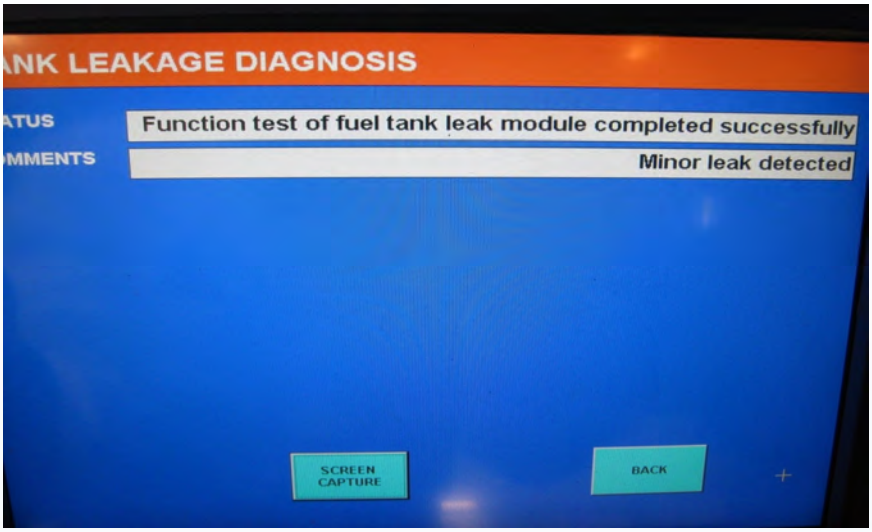
2006 BMW 320I P0456 Small Leak



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2006 BMW 320I P0456 Small Leak

No Smoke Present BUT The Flow Meter Indicates A Leak

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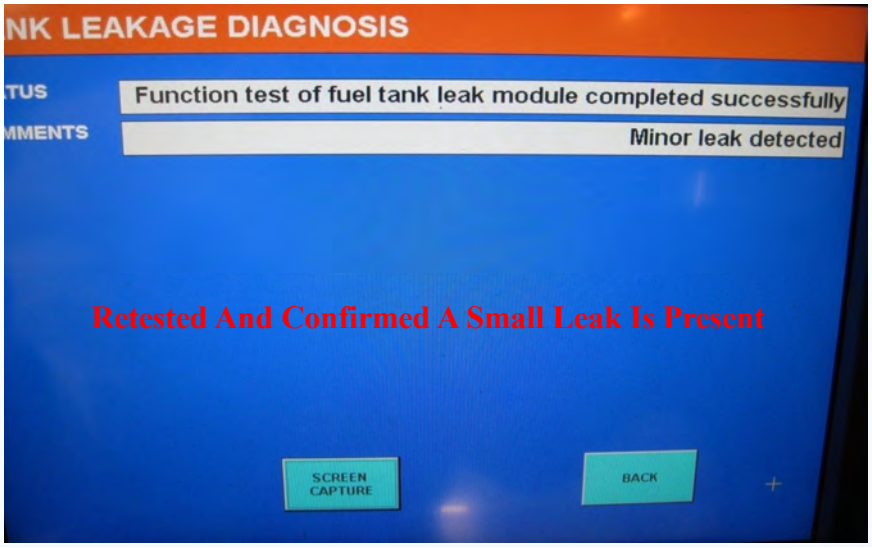
2006 BMW 320I P0456 Small Leak



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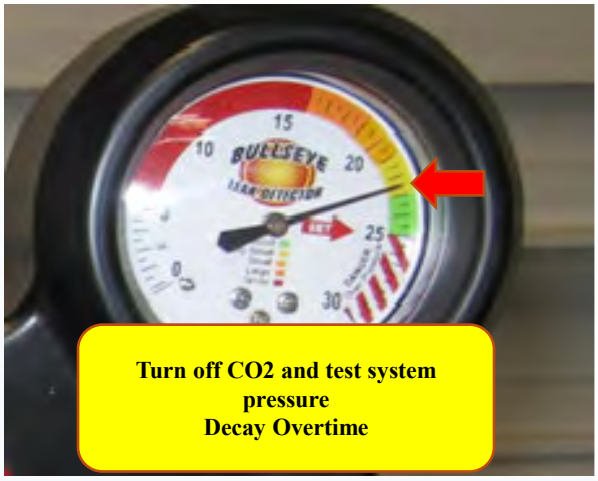
2006 BMW 320I P0456 Small Leak



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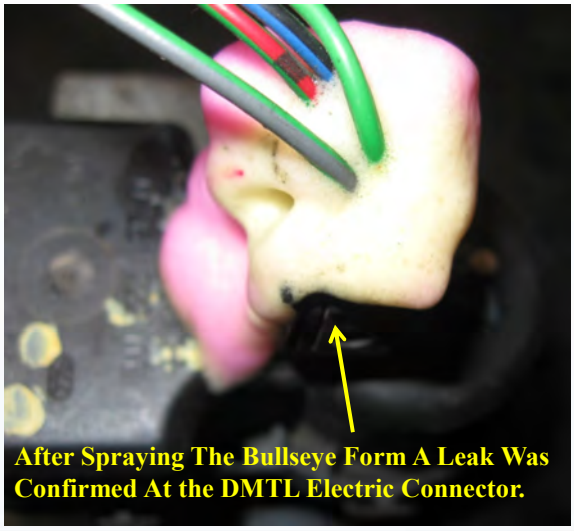
2006 BMW 320I P0456 Small Leak

Use Bullseye Leak Detector to find location of leak



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Dorman "Mastering the Technology"
All Day Training Event
& Trade Show!
Saturday, September 23rd, 2023
8:00am to 6:00pm
ATC (Warminster Campus)
900 Johnsville Blvd, Warminster, PA 18974
(Directions)
4 Plus Top Instructors!
with Dorman's lead trainer
"G" Jerry Truglia,
with Pete Meier,
Kenneth Zanders,
Two Spanish Classes
with Oscar Gomez
Special Key Keynote Speaker:
Carm Capriotto from
"Remarkable Results"
for more info. email:
drestucci@dormanproducts.com
"CAN BUS Communication" 2023 - Instructor Ken Zanders
This class/seminar explains the working of the control area network and what is needed to know and test. Provided is CAN BUS communication diagnosing and testing using scan tools, meters, BOB (break out box) and Labscopes. and more...
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Instructor Oscar Gomez
Los temas cubiertos incluyen circuitos y pruebas de circuitos, aperturas, cortocircuitos, caídas de voltaje, pruebas de relés, uso de medidores (DMM), uso de medidores de laboratorio/gráficos, sensores, actuadores. También se cubren el arranque, la batería, el alternador, los sensores, las computadoras y más. Esta capacitación brindará información sobre cómo aprovechar al máximo sus herramientas y equipos, para que pueda encontrar y reparar problemas eléctricos en los vehículos de hoy.
"Pensamiento Crítico - Estrategias de Diagnóstico 2023" Instructor Oscar Gomez
Esta popular clase/seminario se actualizó a partir de 2021. El éxito en el diagnóstico de los sistemas de alta tecnología actuales requiere un enfoque de alta tecnología. Esta clase/seminario cubre las herramientas que necesita para hacer frente a estos desafíos. Aprenderá a desarrollar un proceso de diagnóstico y un "Plan de juego" de diagnóstico. Cómo usar las herramientas que le brindan los OEM; Estrategias de ECM, criterios de configuración de códigos, análisis PID y cómo se pueden usar los ajustes de combustible para orientarlo en la dirección correcta. Este seminario también analiza las baterías, incluida la codificación y la reprogramación, el consumo parásito, la caída de voltaje, las pruebas del motor, incluida la compresión relativa, las pruebas de compresión, las fugas de los cilindros, el análisis de gases, las pruebas de flujo de combustible, el ajuste de combustible, el aumento de corriente, las pruebas de PCM, los transductores de presión y la reprogramación. una nueva forma de probar EVAP y mucho más. Esta nueva clase proporcionará las herramientas para el éxito en el diagnóstico de los sistemas de alta tecnología de hoy que requieren un enfoque de alta tecnología. ¡Cubridas están las herramientas que necesita para hacer frente a estos desafíos!
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Thank You !

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