

CURRICULUM GUIDE



Everything You Need To Know

Garage Gurus® is your portal to the most comprehensive training and technical support available in the automotive aftermarket. It is designed to offer you the tools you need to succeed, delivered in the way that best suits your needs.



4 training centers across the country offering **60+** instructor-led, hands-on workshops



Comprehensive e-learning platform available with **110+** titles to master



15 virtual field clinics on our most in-demand technical content, taught by Master Trainers and optimized for a virtual, remote learning setting



35+ product technology vans offering **11** unique technical lunch and learn opportunities



Bilingual ASE-certified Master Techs and Technical Specialists available by phone for fast answers to product and diagnostic questions



Onsite. Online. On-Demand.

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 ASE Test Prep courses are designed for the working technician looking to gain accreditation with ASE. Getting your ASE certification is an important step in advancing your career as an automotive technician. Garage Gurus ASE Test Prep training can assist you with passing your test the first time. These Test Prep courses offer a convenient and effective venue for helping you become comfortable in learning the necessary test taking tips needed to become ASE certified.

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WORKSHOPS
 One of our best venues for complete and thorough technical training. Our daytime training courses provide plenty of time to dive deep into the details of the topic at hand. We provide lunch and adequate time for proper classroom explanation, leaving plenty of time for the most desired format of technical training in the industry – ‘hands-on’. We spend a good portion of time in our state-of-the-art technical facilities applying installation practices and test procedures discussed in the classroom. Our workshop training is available in half, full, two, and four day lengths.

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ONSITE FIELD CLINICS 30
 The high levels of quality found in Garage Gurus training is also found beyond the walls of our nationwide Garage Gurus Technical Support Centers. Our field clinics are held throughout the country all year long. Field clinics are local, three-hour presentations given by one of Garage Gurus ASE Certified Master Trainers on selected topics. These clinics are designed for the professional technician and are usually presented during the evening hours to maximize attendance and minimize time away from the shop.

HEAVY DUTY COURSES 44
 The in-class workshop experience allows students to work hand-in-hand with a Garage Gurus HD Master Trainer at one of our conveniently located Technical Support Centers (TSCs).

MOBILE AUTOMOTIVE TRAINING CENTER COURSES 49
 Taught by the same Master Trainers found at our training centers, the Garage Gurus MATC is housed in a 53’ double-expandable trailer capable of both in-class and hands-on training. Get the expertise and know-how you’ve come to expect from the Gurus, in a unique mobile setting.

VIRTUAL FIELD CLINICS 50
 Our most in-demand Field Clinic topics are now available in a new virtual format. Straight from our facility bays, our virtual training provides a unique combination of hands-on vehicle demonstrations and in-class lecture presentations. These courses are created and taught by our Master Trainer team, and bring the experience of in-person training, and the value of in-class teaching, straight to all devices.

ABOUT CASE CONTINUING EDUCATION UNITS (CEUs)

The Continuing Education Unit (CEU), is commonly used by many organizations as the standard unit of measure to quantify adult education and training activities. The International Association of Continuing Education and Training (IACET) defines the CEU as “ten contact hours of participation in organized continuing education experience under responsible, qualified direction and instruction.” The CASE CEU was introduced under this program to represent an automotive industry-specific unit of measure that not only quantifies the ten hours of training, but also qualifies the training as having been provided in accordance with the CASE Standards. Therefore, only ASE-accredited CASE Providers are authorized to issue CASE CEUs. One CASE CEU is equal to ten (10) contact hours of participation in a CASE Activity. One “contact hour” is equal to a minimum of fifty (50) minutes of instructional time within one clock hour.

ASE TEST PREP WORKSHOPS



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All ASE courses have a recommended 30 student max*

*Contingent upon sanitary and social distancing guidelines.

ENGINE REPAIR

ASE A1 Test Prep for Engine Repair **ES**

Course Length: 4 hours

This workshop reviews the needs for passing the ASE A1 Engine Repair Test. A Garage Guru overviews general test taking procedures and guidelines. This workshop includes reviewing several ASE sample questions and the logic behind the way they were written. We provide a summary of the description and operation for the following items taken from the task list for the ASE A1 test.

- General Engine Diagnosis
- Cylinder Head and Valve Train Diagnosis and Repair
- Engine Block Diagnosis and Repair
- Lubrication and Cooling Systems Diagnosis and Repair
- Fuel, Electrical, Ignition and Exhaust Systems Diagnosis and Repair

AUTOMATIC TRANSMISSIONS/TRANSAXLES

ASE A2 Test Prep for Automatic Transmissions **ES**

Course Length: 4 hours

This workshop will review the needs for passing the ASE A2 Automatic Transmission/Transaxle Test. A Garage Guru will overview general test taking procedures and guidelines. The workshop will include reviewing several ASE sample questions and the logic behind the way they were written. We will provide a summary of the description and operation for the following items taken from the task list for the ASE A2 test:

- General Transmission/Transaxle Diagnosis
 - Mechanical/Hydraulic Systems
 - Electronic Systems
- In-Vehicle Transmission/Transaxle Maintenance and Repair
- Off-Vehicle Transmission/Transaxle Repair
 - Removal and Installation
 - Disassembly and Assembly
 - Friction and Reaction Units

ES Available in Spanish • Disponible en español



MANUAL TRANSMISSIONS AND AXLES

ASE A3 Test Prep for Manual Transmissions and Axles

Course Length: 4 hours

This workshop will review the needs for passing the ASE A3 Manual Drivetrain and Axles Test. A Garage Guru will overview general test taking procedures and guidelines. The workshop will include reviewing several ASE sample questions and the logic behind the way they were written. We will provide a summary of the description and operation for the following items taken from the task list for the ASE A3 test:

- Clutch Diagnosis and Repair
- Transmission Diagnosis and Repair
- Transaxle Diagnosis and Repair
- Drive Shaft/Half-Shaft and Universal Joint/constant Velocity (CV) Joint Diagnosis and Repair (Front and Rear Wheel Drive)
- Drive Axle Diagnosis and Repair
 - Ring and Pinion gears
 - Differential Case/Carrier Assembly
 - Limited Slip/Locking Differential
 - Axle Shafts and Housing
- Four-Wheel Drive/All Wheel Drive Component Diagnosis and Repair

STEERING AND SUSPENSION

ASE A4 Test Prep for Steering and Suspension

Course Length: 4 hours

This workshop reviews the needs for passing the ASE A4 Steering and Suspension Test. A Garage Guru overviews general test taking procedures and guidelines. The workshop includes reviewing several ASE sample questions and the logic behind the way they were written. We provide a summary of the description and operation for the following items taken from the task list for the ASE A4 test:

- Steering Systems Diagnosis and Repair
 - Steering Columns
 - Steering Units
 - Steering Linkage
 - Electric Assist
- Suspension Systems Diagnosis and Repair
 - Front Suspensions
 - Rear Suspensions
- Related Suspension and Steering Service
- Wheel Alignment Diagnosis, Adjustment, and Repair
- Wheel and Tire Diagnosis and Service

 Available in Spanish • Disponible en español

BRAKE

ASE A5 Test Prep for Brakes

Course Length: 4 hours

This workshop reviews the needs for passing the ASE A5 Brakes Test. A Garage Guru overviews general test taking procedures and guidelines. The workshop includes reviewing several ASE sample questions and the logic behind the way they were written. We provide a summary of the description and operation for the following items taken from the task list for the ASE A5 test:

- Hydraulic System Diagnosis and Repair
 - Master Cylinder
 - Lines and Hoses
 - Valves and Switches
 - Bleeding, Flushing and Leak Testing
- Drum Brake Diagnosis and Repair
- Disc Brake Diagnosis and Repair
 - Power Assist Units Diagnosis and Repair
 - Miscellaneous Systems Diagnosis
 - Electronic Brake Control Systems
- Diagnosis and Repair

ELECTRICAL

ASE A6 Test Prep for Electrical and Electronic Systems

Course Length: 4 hours

This workshop reviews the needs for passing the ASE A6 Electrical and Electronic Systems Test. A Garage Guru overviews general test taking procedures and guidelines. This workshop includes reviewing several ASE sample questions and the logic behind the way they were written. We provide a summary of the description and operation for the following items taken from the task list for the ASE A6 test:

- General Electrical /Electronic System overview
- Battery and Starting System Diagnosis and Repair
- Charging System Diagnosis and Repair
- Lighting Systems Diagnosis and Repair
- Instrument Cluster and Driver Information Systems Diagnosis and Repair
- Body Electrical Systems Diagnosis and Repair

 Available in Spanish • Disponible en español



HVAC

ASE A7 Test Prep for Heating and Air Conditioning **ES**

Course Length: 4 hours

This workshop reviews the needs for passing the ASE A7 Heating and Air Conditioning Test. A Garage Guru overviews general test taking procedures and guidelines. This workshop includes reviewing several ASE sample questions and the logic behind the way they were written. We provide a summary of the description and operation for the following items taken from the task list for the ASE A7 test:

- A/C System Service, Diagnosis and Repair
- Refrigeration System Component Diagnosis and Repair
- Compressor and Clutch
- Evaporator, Condenser and Related Components
- Heating and Engine Cooling Systems Diagnosis and Repair
- Operating Systems and Related Controls Diagnosis and Repair
- Electrical
- Vacuum/Mechanical
- Automatic and Semi-Automatic Heating, Ventilating and A/C Systems

DRIVABILITY

ASE A8 Test Prep for Engine Performance **ES**

Course Length: 4 hours

This workshop reviews the needs for passing the ASE A8 Engine Performance Test. A Garage Guru overviews general test taking procedures and guidelines. This workshop includes reviewing several ASE sample questions and the logic behind the way they were written. We provide a summary of the description and operation for the following items taken from the task list for the ASE A8 test:

- General Engine Diagnosis
- Ignition System Diagnosis and Repair
- Fuel, Air Induction and Exhaust System Diagnosis and Repair
- Emission Control Systems Diagnosis and Repair
- Computerized Engine Control Diagnosis

ES Available in Spanish • Disponible en español

LIGHT DIESEL ENGINES

ASE A9 Test Prep for Light Diesel Engines **ES**

Course Length: 4 hours

This workshop reviews the needs for passing the ASE A9 Light Vehicle Diesel Engines Test. A Garage Guru overviews general test taking procedures and guidelines. This workshop includes reviewing several ASE sample questions and the logic behind the way they were written so that you can understand how to pass the test. We provide a summary of the description and operation for the following items taken from the task list for the ASE A9 test:

- General diagnosis
- Cylinder head and valve train diagnosis and repair
- Engine block diagnosis and repair
- Lubrication and cooling systems diagnosis and repair
- Air induction and exhaust systems diagnosis and repair
- Fuel system diagnosis and repair ABS/Stability Control and Traction Control Diagnostics **ES**

AUTOMOTIVE MAINTENANCE

ASE G1 Automotive Maintenance and Light Repair

Course Length: 4 hours

This workshop reviews the needs for passing the ASE G1 Automotive Maintenance and Light Repair. A Garage Guru overviews general test taking procedures and guidelines. This workshop includes reviewing several ASE sample questions and the logic behind the way they were written. We provide a summary of the description and operation for the following items taken from the task list for the ASE G1 test.

- Engine Systems
- Automatic Transmission/Transaxle
- Manual Drive Train and Axles
- Suspension and Steering
- Brakes
- Electrical
- Heating, Ventilation and Air Conditioning

ES Available in Spanish • Disponible en español



ADVANCED ENGINE PERFORMANCE


ASE L1 Test Prep for Advanced Engine Performance

Course Length: 4 hours

This workshop reviews the needs for passing the ASE L1 Advanced Engine Performance Test. A Garage Guru overviews general test taking procedures and guidelines. This workshop includes reviewing several ASE sample questions and the logic behind the way they were written.

We provide a summary of the description and operation for the following items taken from the task list for the ASE L1 test:

- Computerized Engine Control
- Computerized Powertrain Controls Diagnosis
- Ignition System Diagnosis
- Fuel Systems and Air Induction Systems Diagnosis
- Emission Control Systems Diagnosis
- I/M Failure Diagnosis

 Available in Spanish • Disponible en español

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Half Day Workshops seat a maximum of 12 students.



BRAKE

Brake System Service Tips and Techniques

Workshop Length: 4 hours, 0.4 CEUs awarded

The workshop is designed with a combination of classroom and hands-on education to enhance the technician's ability to properly diagnose automotive and light truck braking systems. In this class we discuss how to pinpoint the causes of brake pulls, brake vibrations and brake noise complaints. Proper service procedures are reviewed and installation tips are covered to prevent comebacks. The causes of uneven brake pad wear are also identified. We use live vehicles in the shop to help illustrate some of these points.

After completing this workshop, the student will have the knowledge to:

- Pinpoint noise problems
- Diagnose brake pull concerns
- Properly service automotive brake systems
- Understand 'uneven' brake pad wear
- Locate the source of brake vibration concerns
- Analyze faults found in wheel speed sensor waveforms
- Differentiate circuit or component failures found when diagnosing wheel speed sensor DTCs

Electronic Brake Control (EBC) Systems

Workshop Length: 4 hours, 0.4 CEUs awarded

This workshop is designed for classroom education to enhance the technician's ability when performing base brake service on vehicles with Electronic Brake Control (EBC). These systems are found on many luxury and hybrid vehicles. We discuss the operation of the brake system components involved and how apply pressure is generated. In addition, ABS/stability control system operation found on EBC systems are reviewed.

After completing this workshop, the student will have the knowledge to:

- Discuss the function and components of EBC system
- Evaluate scan tool data and fault codes through Case Studies
- Identify procedures to prepare the vehicle for base brake service
- Discuss brake service issues that relate to base brake service and misdiagnosis

 Available in Spanish • Disponible en español

DRIVABILITY

Engine Performance Diagnostic Strategies

Workshop Length: 4 hours, 0.4 CEUs awarded

This workshop uses a combination of classroom and hands-on education to keep technicians current on changing Engine Management Systems and diagnostic tools for Asian and Domestic vehicles. The most frequently seen emission based DTC (Diagnostic Trouble Codes) diagnostic routines are reviewed in the classroom and applied in the service bays. The workshop helps technicians become more proficient in interpreting the information the scan tool provides for engine performance diagnostics. We establish a foundation utilizing "strategy based diagnostics" to reduce diagnostic time and prevent Check Engine Light comebacks. We discuss how to interpret Scan Tool information to gain diagnostic direction to repair today's most seen Engine Performance concerns.

After completing this workshop, the student will have the knowledge to:

- Review OBD II monitor strategy pertaining to the testing of emission related sensors
- Evaluate Scan Tool information on emissions/performance related PIDs (Parameter Identification Data) by using the Graphing function of the Scan Tool to 'trend' important PID relationships
- Diagnose emission related Check Engine light problems on vehicles using generic and enhanced Scan Data analysis
- Apply five diagnostic checks before catalytic converter replacement
- Interpret important Engine Performance sensor information and vehicle operating system strategies
- Recognize Fuel System monitoring strategies, operation and diagnostic routines

Gasoline Direct Injection

Workshop Length: 4 hours, 0.4 CEUs awarded

The demand for more efficient, smarter and environmentally cleaner liquid-fueled spark ignition (SI) engines is a primary focus of today's vehicle manufacturers. GDI SI (Spark Ignited) engines have overcome many limitations and are now becoming commonplace. This workshop provides a comprehensive overview of GDI engines. Various engine operating modes (start-up injection, late injection, operating mode transition) are explored. An explanation of mixture preparation leading to the combustion process is outlined. An emphasis on operational strategies for both homogenous and stratified charge fuel control is reviewed. Issues related to the direct injection of gasoline into the combustion chamber are highlighted. Fuel injection system requirements for optimal spray characteristics are discussed. Emission of pollutants, fuel economy and effects of some key design and operating parameters are also covered.

After completing this workshop, the student will have the knowledge to:

- Describe the operating characteristics behind GDI engine operation
- Analyze the important criteria leading up to maximum performance in GDI engines such as proper operation of the Fuel Delivery system
- Explain injector spray and atomization requirements for successful GDI operation
- Utilize service tools and techniques to properly disassemble and reassemble GDI fuel systems
- Analyze important scan tool data parameters in verifying proper GDI engine performance
- Interpret scope waveforms captured from fuel injectors and other fuel system components
- Understand effects of key engine design and operating conditions on performance, combustion, and emission within GDI engines

 Available in Spanish • Disponible en español



DRIVABILITY

Understanding CAN Networks

Workshop Length: 4 hours, 0.4 CEUs awarded

This workshop helps technicians understand, identify and diagnose CAN (Controller Area Network) communication networks. We review network fundamentals to help the technician understand the need, strategy and protocol of CAN. To aid in diagnostics, various types of network topology are explored and explained. To help pinpoint CAN failures, several electrical circuit integrity test methods are outlined to validate root cause of CAN communication failures. Application of the diagnostic strategies are demonstrated in our state-of-the-art service bays using modern diagnostic equipment.

After completing this workshop, the student will have the knowledge to:

- Identify Network type and topology
- Utilize the proper tools and test procedures when diagnosing network fault
- Diagnose 'U' code failures on CAN networks
- Test for 'No Communication' failures on CAN networks

ELECTRICAL

Hands-On Electrical Diagnostics

Workshop Length: 4 hours, 0.4 CEUs awarded

This workshop is designed for technicians who have a basic understanding of electrical theory and are ready to put it to use. A large portion of this class is spent in our state-of-the-art shop working on vehicles with common, everyday automotive electrical test equipment. Technicians walk through a quick procedure to check battery, starting and charging systems, utilizing a DMM to assist in accurate diagnosis. Common sensor inputs and outputs are explored with emphasis on diagnostic procedures and on-car testing. Input testing includes diagnosing three wire analog sensors, variable reluctance sensors and digital sensors. Output testing includes, pulse width modulated solenoids and DC motors.

After completing this workshop, the student will have the knowledge to:

- Diagnose common battery, starting, and charging issues using DMM
- Understand and diagnose common 3 wire analog and digital sensors
- Measure and test Duty Cycle outputs for diagnostics
- Use amperage draw to diagnose DC Motor failures

Battery, Starting and Charging System Diagnostics

Workshop Length: 4 hours, 0.4 CEUs awarded

This workshop is designed for technicians who have a basic understanding of electrical theory and are ready to put it to use. We begin with highlighting information on battery testing and battery replacement. We will discuss proper battery testing methods and what may need to be done during a replacement. Starting systems have become more efficient and the circuits to control them include complex security protocols. The methods for validating faults within a starter circuit still revolve around the understanding of basic electricity. Good practices are critical to not overlooking an obvious fault. We will cover how to diagnosis a 'no start' condition and what the quickest way is to pinpoint the problem. Charging system controls have advanced and many manufacturers have specific charging system strategies that are used to aid in longer battery life and increased economy. We discuss the different variations of 'smart charging systems' and what testing methods you need to employ to avoid replacing a costly alternator that was not the root of the problem. In-bay vehicle demonstrations are part of this workshop.

After completing this workshop, the student will have the knowledge to:

- Diagnose common battery, starting, and charging issues using the latest diagnostic equipment
- Understand the different automotive battery types and testing methods
- Measure charging system output and validate proper PCM control
- Use system wiring schematics to aid in diagnosing charging system faults

IGNITION

Analyzing Today's Ignition Systems

Workshop Length: 4 hours, 0.4 CEUs awarded

This workshop discusses diagnostic shortcuts and test methods that streamline the time spent pinpointing failures within the Ignition system. Modern COP Ignition system operation is reviewed in the classroom and tested in the service bays. Primary and Secondary Ignition waveforms are captured and reviewed in the service bays using the latest automotive diagnostic equipment.

After completing this workshop, the student will have the knowledge to:

- Interpret enhanced scan tool data helpful in the diagnosing a P0300 (random cylinder misfire) DTC
- Diagnose 'hard start' and 'no start' conditions
- Pinpoint causes of 'intermittent' misfire
- Analyze Ignition waveforms captured with a lab scope

How to Use Your Lab Scope

Workshop Length: 4 hours, 0.4 CEUs awarded

In this workshop we present how to set up and operate a lab scope for the purpose of testing automotive sensors and components of various types. We cover set up procedures, voltage and time base settings, and waveform capturing techniques. Waveform analysis is discussed on many different captures to differentiate 'good' and 'bad.' Several on-car demonstrations take place in our state-of-the-art service bays during this workshop.

After completing this workshop, the student will have the knowledge to:

- Set up and capture automotive waveforms using a lab scope
- Configure lab scope settings for optimized viewing of waveforms
- Properly connect a lab scope to various solenoids, actuators, speed and position sensors, and DC motors found under hood and undercar

STEERING AND SUSPENSION

Diagnosing Modern Chassis Systems

Workshop Length: 4 hours, 0.4 CEUs awarded

This workshop is designed to focus on the high volume repair opportunities found in the undercar sector of the automotive industry. The important relationships between component integrity, alignment geometry, vehicle handling and tire wear are defined. We discuss proper inspection procedures for all suspension and steering system types. Hands-on shop demonstrations in our state-of-the-art service bays are performed during this workshop.

After completing this workshop, the student will have the knowledge to:

- Properly perform steering and suspension inspection procedures
- Relate worn chassis components to tire life, steering, stopping and stability
- Identify various types of vehicle steering systems and their operations (hydraulic and electric)
- Inspect, properly diagnose and replace wheel hub bearings of all types

 Available in Spanish • Disponible en español

SERVICE WRITER TRAINING

Service Writer – Steering and Suspension

Workshop Length: 4 hours, 0.4 CEUs awarded

This workshop enhances the skills of the service professional working as the interface between the customer and the business. Effective customer communication and selling skills are highlighted throughout this workshop. Emphasis is placed on practicing the 4C model (concern, cause, correction and consequence). Attendees are trained on how to professionally interact with their customers. Several role play exercises take place throughout the workshop so attendees can practice and hone their skills. This workshop focuses on a light technical overview of a vehicle's steering and suspension system.

After completing this workshop, the student will have the knowledge to:

- Professionally communicate the corrective action necessary for servicing a vehicle's steering and suspension system
- Interact professionally with the customer
- Communicate the benefits of replacing steering and suspension components with premium parts to the customer

Service Writer – Brake Systems

Workshop Length: 4 hours, 0.4 CEUs awarded

This workshop enhances the skills of the service professional working as the interface between the customer and the business. Effective customer communication and selling skills are highlighted throughout this workshop. Emphasis is placed on practicing the 4C model (concern, cause, correction and consequence). Attendees are trained on how to professionally interact with their customers. Several role play exercises take place throughout the workshop so attendees can practice and hone their skills. This workshop focuses on a light technical overview of a vehicle's brake system's components.

After completing this workshop, the student will have the knowledge to:

- Professionally communicate the corrective action necessary for servicing a vehicle's braking system
- Interact professionally with the customer
- Communicate the benefits of a premium brake service to the customer

 Available in Spanish • Disponible en español

FULL DAY WORKSHOPS



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Full Day Workshops seat a maximum of 8 students.

BRAKE

ABS/Stability Control and Traction Control Diagnostics **ES**

Workshop Length: 1 day (8 hours), 0.8 CEUs awarded

This workshop is designed with a combination of classroom and hands-on education to enhance the technician’s ability to properly diagnose automotive ABS, stability control and traction control systems. We will discuss the operation of the most current ABS/stability control systems utilized by Domestic, Asian and European vehicle manufacturers.

After completing this workshop, the student will have the knowledge to:

- Discuss the function and components of ABS/stability control systems
- Evaluate scan tool data and fault codes
- Recognize the correct test procedures using scan tool data, oscilloscope, DMM and graphing to view and diagnose yaw/lateral force and steering wheel position (SWP) sensors
- Identify base brake system issues that relate to unwanted ABS application and misdiagnosis
- Differentiate circuit or component failures found when diagnosing wheel speed sensor DTCs

DRIVABILITY

Diagnosing Variable Valve Timing Systems **ES**

Workshop Length: 1 day (8 hours), 0.8 CEUs awarded

This workshop will focus on the different types of variable valve timing (VVT) systems used by vehicle manufacturers today. After multi-valve technology became standard in engine design, VVT became the next step to enhance engine output, increasing engine power and torque output along with reducing emissions. Without VVT technology, engineers previously had to choose the best compromise in valve/cam timing and ended up sacrificing one thing to gain in another area. VVT allows the best of both worlds – increased performance and economy and lower emissions. There are a multitude of DTCs that can set related to VVT faults stemming from oil contamination to inoperative cam actuators and oil control solenoids. We explain the variations of VVT systems used by manufacturers today and look at diagnostic tests that can be performed on this system using the scan tool and other diagnostic equipment to confidently diagnose these systems before the costly and labor-intensive engine teardown for service.

After completing this workshop, the student will have the knowledge to:

- Identify the VVT system types used by manufacturers
- Relate to the scan tool parameters used by various manufacturers to validate camshaft control and operation
- Understand the VVT DTC stored in the Powertrain Control Module (PCM)
- Realize the importance of testing the crankshaft position and camshaft position sensors via a lab scope to validate camshaft to crankshaft correlation
- Perform mechanical engine testing and diagnosis using electronic pressure transducers
- Diagnose engine breathing related faults (both intake and exhaust) using fuel trim and volumetric efficiency testing information via the scan tool
- Utilize new scan tool information and techniques to reduce diagnostic time in the service bay for VVT related faults or symptoms

ES Available in Spanish • Disponible en español



Advanced Oscilloscope Engine Testing

Workshop Length: 1 day (8 hours), 0.8 CEUs awarded

This workshop will focus on the different types of electronic engine diagnostic procedures used to diagnose today's engines. Both in-cylinder pressure transducers and manifold vacuum transducers used with a digital storage oscilloscope (DSO) can reduce valuable diagnostic and teardown time on today's VVT equipped multi-cam engines.

Engine performance and emissions can be severely impacted by cam timing concerns caused from lack of oil, failed timing chain tensioners and/or stretched timing chains or belts. Volumetric efficiency reductions caused by lack of air flow concerns from restrictions in the intake or exhaust systems can cause Low Power concerns. Air leaks in the induction system cause Check Engine lights and can be difficult to validate and pinpoint. Engine compression issues can be significant in size or very small, almost undetectable at times, leading to misfire DTCs. Relative compression testing can reduce the time it takes to validate a compression issue on an engine. These types of problems can skew the diagnostic information in the scan tool and can make it unreliable or unclear. In this class you learn the benefits of modern diagnostic equipment and learn when and how to use these testing techniques on the vehicle.

After completing this workshop, the student will have the knowledge to:

- Identify what tests to apply to accurately pinpoint the cause of engine performance concerns such as lack of power, run roughs, vacuum leaks and engine misfire
- Perform relative compression tests using both scan tools and lab scopes with a high amp current probe
- Perform mechanical engine testing and diagnosis using electronic pressure transducers
- Perform cranking vacuum tests on the engine using both the scan tool and a lab scope with vacuum transducer to validate air leaks
- Validate engine camshaft to crankshaft correlation accurately using lab scope tests
- Utilize new scan tool information and techniques to reduce diagnostic time in the service bay for VVT related faults or symptoms

CAN Networks

Workshop Length: 1 day (8 hours), 0.8 CEUs awarded

This workshop helps technicians understand, identify and diagnose CAN (Controller Area Network) communication networks. We review network fundamentals to help the technician understand the need, strategy and protocol of CAN. To aid in diagnostics, various types of network topology are explored and explained. To help pinpoint CAN failures, several electrical circuit integrity test methods are outlined to validate root cause of CAN communication failures. Application of the diagnostic strategies are demonstrated in our state-of-the-art service bays using modern diagnostic equipment. This workshop includes hands-on bay activities supporting the aforementioned topics.

After completing this workshop, the student will have the knowledge to:

- Identify Network type and topology
- Utilize the proper tools and test procedures when diagnosing network fault
- Diagnose 'U' code failures on CAN networks
- Test for 'No Communication' failures on CAN networks

Evaporative Emission Control Systems

Workshop Length: 1 day (8 hours), 0.8 CEUs awarded

This workshop is designed to aid technicians in the understanding of how to diagnose and repair today's Evaporative Emission Control Systems. We will cover several types of Enhanced Evaporative Emission systems with a focus placed on Leak Detection Pumps (LDP) and Evaporative System Integrity Modules (ESIM). We will also discuss operating strategies for Engine Off Natural Vacuum (EONV) systems and Natural Vacuum Leak Detection (NVLD) systems. Leak testing procedures using smoke test equipment will be reviewed. Diagnostic methods for quickly pinpointing the cause of common EVAP DTC's will be highlighted. This workshop includes hands-on bay activities supporting the aforementioned topics.

After completing this workshop, the student will have the knowledge to:

- Identify the type of enhanced EVAP system being diagnosed
- Use the OBD II monitors to aid in diagnosis and testing
- Utilize scan tool bi-directional controls for testing
- Test for small and large EVAP leaks using smoke tests
- Determine the most effective and time saving 'next step' in the diagnostic process

Gasoline Direct Injection

Workshop Length: 1 day (8 hours), 0.8 CEUs awarded

The demand for more efficient, smarter and environmentally cleaner liquid-fueled spark ignition (SI) engines is a primary focus of today's vehicle manufacturers. This workshop provides a comprehensive overview of GDI engines. Various engine operating modes (start-up injection, late injection, operating mode transition) are explored. An explanation of mixture preparation leading to the combustion process is outlined. An emphasis on operational strategies for both homogenous and stratified charge fuel control is reviewed. Issues related to the direct injection of gasoline into the combustion chamber are highlighted. Fuel injection system requirements for optimal spray characteristics are discussed. Emission of pollutants, fuel economy and effects of some key design and operating parameters are also covered. This workshop includes hands-on bay activities supporting the aforementioned topics.

After completing this workshop, the student will have the knowledge to:

- Describe the operating characteristics behind GDI engine operation
- Explain injector spray and atomization requirements for successful GDI operation
- Utilize service tools and techniques to properly disassemble and reassemble GDI fuel systems
- Analyze important scan tool data parameters in verifying proper GDI engine performance
- Interpret scope waveforms captured from fuel injectors and other GDI fuel system components

IGNITION

Ignition Systems Failures and Diagnostics

Workshop Length: 1 day (8 hours), 0.8 CEUs awarded

This workshop is designed with a combination of classroom and hands-on education to enhance the professional level technician's knowledge of modern ignition system diagnostics. P0300 misfire DTC diagnostic strategies are covered using modern scan tools and ignition system testing equipment. Technicians use digital storage oscilloscopes (DSOs), current probes, inductive wands and voltage leads to test modern ignition system components ranging from crankshaft and camshaft position sensors to today's COP (Coil on Plug) assemblies. Today's vehicle operational strategies are reviewed pertaining to OBD II Misfire Monitoring.

After completing this workshop, the student will have the knowledge to:

- Accurately test crankshaft position and camshaft position sensors
- Distinguish the difference between testing procedures for conventional ignition coils and 'smart coil' assemblies
- Interpret ignition component waveforms captured from a DSO (Digital Storage Oscilloscope)
- Recognize different manufacturers' operational strategy during misfire conditions
- Understand fuel trim corrections during ignition misfire conditions
- Identify PCM strategies that prevent catalytic converter damage due to Type A misfires

STEERING AND SUSPENSION

Advanced Steering and Suspension Diagnostics

Workshop Length: 1 day (8 hours), 0.8 CEUs awarded

This workshop enhances the skills of the professional undercar technician in the area of steering systems on both hydraulic and electronic assist units. Steering systems have evolved from hydraulic pump assisted steering gears to modern EPS (electric power steering) designs that can provide various level of assist. Each system's component operation is discussed and the strategies of operation are outlined. Information on steering angle sensor recalibration and sensor testing on both hydraulic and electrical assist steering units are reviewed. We also discuss electronic and mechanical suspension ranging from variable valve ride control systems to modern magnetorheological damper systems. Operation and diagnostic tips for air, nitrogen and hydraulic suspension systems are included in this workshop. Numerous diagnostic strategies are reviewed related to owner concerns of accelerated tire wear and inadequate steering, stopping and stability that may be caused by a suspension component failure.

After completing this workshop, the student will have the knowledge to:

- Define the operation of various electronically assisted steering systems (column drive, rack motor drive, belt drive)
- Overview variable ratio system operation from various manufacturers
- Diagnose hydraulic steering assist concerns and causes of noise and intermittent assist
- Utilize scan tools and other methods to service the system and recalibrate sensors after repairs and wheel alignment
- Identify the components and operation of late model ride control systems and related service procedures
- Utilize scan tools for diagnosis and bi-directional testing on both electronic steering and suspension controls

 Available in Spanish • Disponible en español

Advanced Alignment Diagnostics

Workshop Length: 1 day (8 hours), 0.8 CEUs awarded

This workshop enhances the skills of the professional undercar technician in the area of advanced and standard wheel alignment. It covers suspension and steering diagnosis due to bent parts from accidents and road hazards, vehicle modifications, tire/wheel resizing and height issues. A thorough understanding of camber, caster, toe, steering axis inclination (SAI), included angle, scrub radius and toe out on turns will assist the alignment technician in utilizing the aligner as a diagnostic tool. Related electronic systems are also covered in this course. Vehicle component inspection and customer communication skills are necessary traits for any successful alignment tech and the importance of these skills are stressed in this class.

After completing this workshop, the student will have the knowledge to:

- Utilize the alignment machine as a diagnostic tool for the alignment and repair of vehicles involved in road hazard incidents and vehicle collisions
- Identify root causes for uneven or erratic tire wear and handling problems. Effectively communicate the results to the vehicle owner
- Identify how vehicle modifications and tire/wheel changes affect alignment and dynamic operation
- Analyze related electronic systems that interact with the chassis system in need of recalibration or adjustment after the alignment procedure

ELECTRICAL

Hands-On Electrical Testing

Workshop Length: 1 day (8 hours), 0.8 CEUs awarded

This workshop is designed for technicians who have a basic understanding of electrical theory (voltage, current flow, ohms and watts) and are ready to put it to use. A large portion of this class is spent in our state-of-the-art shop working on vehicles with common, everyday automotive electrical test equipment. Technicians walk through common electrical test practices on bugged vehicles utilizing a DMM (digital multimeter) to assist in accurate diagnosis. Common sensor inputs and outputs are explored with emphasis placed on diagnostic procedures and on-car testing. Input testing includes diagnosing three wire analog sensors, variable reluctance sensors and various digital sensors. Output testing includes, pulse width modulated solenoids and DC motors. This workshop includes hands-on bay activities supporting the aforementioned topics.

After completing this workshop, the student will have the knowledge to:

- Diagnose vehicle charging issues using DMM and load testing tool
- Understand and diagnose common 3 wire analog and digital sensors
- Measure and test Pulse Width Modulated (PWM) and Duty Cycle outputs
- Measure current flow to diagnose electrical circuit and component failures
- Employ scan tool usage in conjunction with electrical circuit tests

 Available in Spanish • Disponible en español

Body Electrical **Workshop Length: 1 day (8 hours), 0.8 CEUs awarded**

This workshop is designed for technicians who already have a solid electrical foundation and are looking to understand today's vehicles complex body electrical systems. Covered within this workshop will be multiplex network communications and network system diagnostics. We will look at network topology for various body electrical systems and discuss how system modules and components interact with one another. Communication 'gateways' and module diagnostics will be discussed. This course will take a deep dive into several BCM (body control module) controlled systems and will discuss diagnostic strategies using the scan tool, DMM's and lab scopes to pinpoint test and located problems. This workshop includes hands-on bay activities supporting the aforementioned topics.

After completing this workshop, the student will have the knowledge to:

- Understand body control system operation strategies
- Diagnose and test many different vehicle body control systems (lighting, doors, security, etc.)
- Employ scan tool usage in conjunction with electrical circuit tests using a DMM or lab scope
- Analyze and test various networks on the vehicle
- Replace and program (set up) a Body Control module or Gateway module

HVAC**A/C Fundamentals (St. Louis, MO only)** **Workshop Length: 1 day (8 hours), 0.8 CEUs awarded**

This workshop will provide an understanding of the principles behind automotive air conditioning systems. We will take a 'two systems' approach covering refrigerant flow and air flow requirements for proper operation of the system. Within this course all of the functions of the various components (switches, sensors, compressor, condenser, dryer, accumulator, expansion valve, orifice tube, and evaporator) within the air conditioning system will be covered. We will discuss both R134A and 1234YF refrigerant types and the differences. The 609 certification process will be highlighted. System performance and diagnostics through reading the gauges will be reviewed. Effective leak testing methods and proper air conditioning repair procedures will be discussed. This workshop includes hands-on bay activities supporting the aforementioned topics.

After completing this workshop, the student will have the knowledge to:

- Describe normal operating pressures on an air conditioning system
- Explain the importance of system air flow requirements for adequate cooling
- Interpret air conditioning component operation
- Analyze air conditioning system performance and cooling concerns
- Perform safe and proper leak testing methods

HVAC Diagnostics (St. Louis, MO only) **Workshop Length: 1 day (8 hours), 0.8 CEUs awarded**

This workshop is designed to help technicians properly diagnose Heating, Ventilation and Air Conditioning (HVAC) performance problems covering inadequate system cooling performance to interior climate control system operation. HVAC control head testing utilizing a scan tool to read PIDs, relevant DTC's and to perform bi-directional commands will be a focus within this class. Automatic climate control operating strategies ranging from sun load sensor input to variable compressor output control will be reviewed. Many system components including blower motor command and speed diagnostics to blend door operation and position testing will be discussed. This workshop includes hands-on bay activities supporting the aforementioned topics.

After completing this workshop, the student will have the knowledge to:

- Describe relevant scan tool PIDs to aid in diagnosing HVAC system performance
- Understand HVAC gauge readings to pinpoint the root cause of a system problem
- Interpret problematic HVAC system controls through diagnosis and testing
- Analyze air conditioning system performance and cooling concerns
- Determine which side of the system (refrigerant or airflow) has a problem

TWO DAY WORKSHOPS



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BRAKE

Brake Diagnostics and Service **ES**

Workshop Length: 2 days (16 hours), 1.6 CEUs awarded

This workshop is designed with a combination of classroom and hands-on education to enhance the technician’s ability to properly diagnose and service automotive and light truck braking systems. We define the function of brake system components, discussing friction, hydraulic component theory and operation and bleeding. We overview diagnostic procedures used to diagnose brake pull, brake performance and brake noise complaints.

After completing this workshop, the student will have the knowledge to:

- Interpret the proper friction material per vehicle application
- Apply hydraulic theory and use recommended brake service procedures to reduce diagnostic time and eliminate costly misdiagnosis
- Perform measurements of runout and parallelism of brake rotors
- Discuss hydraulic and friction failures on passenger cars and light trucks
- Discuss components and operation of electronic parking brake systems
- Perform a complete brake service, and interpret the proper friction material per vehicle application

Two Day Workshops seat a maximum of 8 students.

ES Available in Spanish • Disponible en español

DRIVABILITY

Engine Performance and Drivability **ES**

Workshop Length: 2 days (16 hours), 1.6 CEUs awarded

This workshop uses a combination of classroom and hands-on education to keep technicians current on changing engine management systems and diagnostic tools for Asian and Domestic vehicles. The most frequently seen emission-based DTC diagnostic routines are reviewed in the classroom and applied in the service bays. The workshop helps technicians become more proficient in interpreting the information the scan tool provides for engine diagnostics. We establish a foundation utilizing strategy-based diagnostics to reduce diagnostic time and prevent Check Engine light comebacks. Learn to interpret scan tool information to gain diagnostic direction to repair today’s most seen engine performance concerns.

After completing this workshop, the student will have the knowledge to:

- Evaluate scan tool information on emissions/performance related parameter identification data (PIDs) by using the graphing function of the tool to trend important PID relationships
- Diagnose emission related Check Engine light problems on vehicles using generic and enhanced scan data analysis
- Five diagnostic checks to perform to before catalytic converter replacement
- Interpret important engine performance sensor information and vehicle operating system strategies
- Recognize fuel system monitoring strategies, operation and diagnostic routines
- Test for causes of the popular fuel system lean (P0171/P0174) and fuel system rich (P0172/P0175) DTCs on all makes, models and fuel injection types

ELECTRICAL

Automotive Electronics **ES**

Workshop Length: 2 days (16 hours), 1.6 CEUs awarded

This workshop is designed for technicians desiring educational instruction on one of today’s hottest subjects. It includes hands-on lab exercises diagnosing electrical circuit faults, voltage drop and current testing. This workshop familiarizes the technician with electricity, electronics and fundamental circuits to become proficient with the diagnostic tools needed to service electrical systems. Students learn skills necessary to develop diagnostic strategies and avoid lengthy troubleshooting. Exercises include the use of diagnostic tools and demonstrations of various types of automotive electrical repairs. Students learn how to quickly identify electrical failures and recommend the proper repair.

After completing this workshop, the student will have the knowledge to:

- Accurately define electrical and electronic components
- Employ the diagnostic tools needed for electrical diagnosis
- Utilize skills to develop diagnostic strategies and avoid lengthy diagnostic times while increasing profitability
- Comprehend electrical schematics and apply knowledge to assist point of failure diagnostics
- Test automotive electronic circuits
- Identify electrical failures and recommend appropriate repair

ES Available in Spanish • Disponible en español



STEERING AND SUSPENSION

Steering and Suspension Service **ES**

Workshop Length: 2 days (16 hours), 1.6 CEUs awarded

This workshop combines classroom and hands-on activities to enhance the diagnostic and service skills of the professional undercar technician in the areas of suspension and ride control diagnosis, steering system diagnosis and wheel alignment. Special emphasis is given to the effects of worn suspension system components on handling, ride quality, tire life and the symptoms to expect if a part has failed. The relationships between component integrity, alignment geometry, vehicle handling and tire wear is stressed. Customer communication skills are presented to help the student explain the value of the suggested repair to the vehicle owner.

After completing this workshop, the student will have the knowledge to:

- Perform accurate vehicle inspections on suspension and steering systems
- Identify the components and operating characteristics of suspension and steering systems on current passenger cars and light trucks
- Apply time-tested service techniques, tool usage and problem-solving parts to ensure accurate steering and suspension repairs in the minimum amount of time
- Utilize the latest alignment equipment to adjust chassis components for optimum tire life, steering, stopping and stability
- Install replacement steering and suspension parts

ES Available in Spanish • Disponible en español

FOUR DAY WORKSHOPS



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BRAKE

Comprehensive Braking Skills **ES**

Course Length: 4 days, 3.2 CEUs awarded

This workshop leads a technician through the path to become a productive, independent Braking technician. Taught from our TSC facilities by our ASE-Certified Master Trainers with an equal balance between classroom instruction and “hands-on” bay training, the 4-day sessions will focus on the following courses:

- Braking Diagnostics and Service – 16 hours
- ABS / Stability Control and Traction Control Diagnostics – 8 hours
- Electronic Brake Control (EBC) on Hybrid & Non-Hybrid Vehicles – 4 hours
- A5 Test Prep for Brakes – 4 hours

Within each of these courses, students will develop these critical Braking repair skills:

- Hydraulic System Diagnosis and Repair:
 - Master Cylinder
 - Lines and Hoses
 - Valves and Switches
 - Bleeding, Flushing and Leak Testing
- Drum Brake Diagnosis and Repair
- Disc Brake Diagnosis and Repair
- Power Assist Units Diagnosis and Repair
- Miscellaneous System Diagnosis
- Power Assist Units Diagnosis and Repair
 - Miscellaneous Systems Diagnosis
 - Electronic Brake Control Systems
- Diagnosis and Repair

ES Available in Spanish • Disponible en español



DRIVABILITY

Comprehensive Driveability Skills

Course Length: 4 days, 3.2 CEUs awarded

This workshop reviews the needs for passing the ASE A8 Engine Performance Test. A Garage Guru overviews general test taking procedures and guidelines. The workshop includes reviewing several ASE sample questions and the logic behind the way they were written. The workshop provides an equal balance between classroom instruction and 'hands-on' bay instruction covering all the items from the ASE task list. Service tips, testing techniques and removal/installation best practices will be covered. We provide a summary of the description and operation for the following items taken from the task list for the ASE A8 test.

We provide a summary of the description and operation for the following items taken from the task list for the ASE A8 test:

- General Engine Diagnosis
- Ignition System Diagnosis and Repair
- Fuel, Air Induction and Exhaust System Diagnosis and Repair
- Emission Control Systems Diagnosis and Repair
- Computerized Engine Control Diagnosis

ELECTRICAL

Comprehensive Automotive Electrical Skills

Course Length: 4 days, 3.2 CEUs awarded

This workshop reviews the needs for passing the ASE A6 Electrical and Electronic Systems Test. A Garage Guru overviews general test taking procedures and guidelines. The workshop includes reviewing several ASE sample questions and the logic behind the way they were written. The workshop provides an equal balance between classroom instruction and 'hands-on' bay instruction covering all the items from the ASE task list. Service tips, testing techniques and removal/installation best practices will be covered. We provide a summary of the description and operation for the following items taken from the task list for the ASE A6 test.

We provide a summary of the description and operation for the following items taken from the task list for the ASE A6 test:

- General Electrical /Electronic System Overview
- Battery and Starting System Diagnosis and Repair
- Charging System Diagnosis and Repair
- Lighting Systems Diagnosis and Repair
- Body Electrical Systems Diagnosis and Repair
- Interpreting Wiring Schematics

 Available in Spanish • Disponible en español

STEERING AND SUSPENSION

Comprehensive Steering & Suspension Skills

Course Length: 4 days, 3.2 CEUs awarded

This workshop leads a technician through the path to become a productive, independent Steering & Suspension technician. Taught from our TSC facilities by our ASE-Certified Master Trainers with an equal balance between classroom instruction and "hands-on" bay training, the 4-day sessions will focus on the following courses:

- Steering & Suspension Service – 16 hours
- Advanced Steering & Suspension Diagnostics – 8 hours
- Electronic Suspension Diagnostics – 4 hours
- A4 Test Prep for Steering & Suspension – 4 hours

Within each of these courses, students will develop these critical Steering & Suspension repair skills:

- | | |
|--|---|
| <ul style="list-style-type: none"> • Steering Systems Diagnosis and Repair <ul style="list-style-type: none"> - Steering Columns - Steering Units - Steering Linkage - Electric Assist | <ul style="list-style-type: none"> • Suspension Systems Diagnosis and Repair: <ul style="list-style-type: none"> - Front Suspensions - Rear Suspensions • Related Suspension and Steering Service • Wheel Alignment Diagnosis, Adjustment, and Repair • Wheel and Tire Diagnosis and Service |
|--|---|

 Available in Spanish • Disponible en español

FIELD CLINICS



The high levels of quality found in Garage Gurus training is also found beyond the walls of our nationwide Garage Gurus Technical Support Centers. Our field clinics are held throughout the country all year long. Field clinics are local, three-hour presentations given by one of Garage Gurus ASE Certified Master Trainers on selected topics. These clinics are designed for the professional technician and are usually presented during the evening hours to maximize attendance and minimize time away from the shop.

WHAT'S INCLUDED

- Each clinic is designed to be approximately three hours of instruction with 30 minutes for dinner preceding the seminar.
- 35 clinic kits are provided for each clinic.

FIELD CLINIC FEES

- Call your DRiV representative for pricing.
- The clinic sponsor is responsible for location and meals.

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ES Available in Spanish • Disponible en español

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BRAKE

Brake System Technology **ES**

**Clinic Length: Approx. 3 hours – minimum of 25 attendees*

This clinic is designed to enhance the technician’s ability to perform proper brake service procedures on today’s vehicles utilizing Electronic Brake Control (EBC) systems. We discuss several Active Safety Systems and the operational strategies used on many new vehicles. Included in this technical seminar is an overview of stability control operation and the modern advancements within this safety technology. Newly mandated braking controls and the impact on vehicle braking performance are reviewed. Special service procedures on the base brake system are outlined. Brake by wire and automatic stop system control inputs and outputs are discussed. Yaw, lateral, accelerometer, wheel speed, active brake booster and brake pressure sensor testing procedures are outlined.

After completing this seminar, the student will have the knowledge to:

- Properly service today’s automotive brake systems
- Diagnose Brake and Stability Control System warning lights
- Discuss base brake service issues that relate to braking performance issues
- Properly inspect, test and calibrate components within the electronic controlled brake system
- Evaluate scan tool data and fault codes through vehicle Case Study examples

**Call your sales representative for pricing*

ES Available in Spanish • Disponible en español



DRIVABILITY

Engine Performance Diagnostic Strategies

***Clinic Length: Approx. 3 hours – minimum of 25 attendees**

This clinic is designed to keep technicians current on changing Engine Management Systems and diagnostic procedures. The focus is on helping the technician become more proficient in interpreting the information the scan tool provides for engine performance diagnostics. We establish a foundation utilizing “strategy based diagnostics” to reduce diagnostic time and prevent emission related Check Engine light comebacks. We discuss utilizing scan tool information to gain diagnostic direction to repair today’s most seen Engine Performance concerns. Putting all the pieces together during an engine diagnostic is a lot like reading a road map; the key to success is finding the shortest path to the destination without getting lost.

After completing this seminar, the student will have the knowledge to:

- Apply a logical flow of diagnosing Check Engine light concerns through understanding what the scan tool data is saying
- Utilize the graphing function of the scan tool to ‘trend’ important scan tool PID (Parameter Identification Data) relationships
- Diagnose emission related Check Engine light problems on vehicles through using generic and enhanced scan data analysis
- Five diagnostic checks to perform to before catalytic converter replacement
- Interpret important engine performance sensor information and vehicle operating system strategies

Diagnosing Variable Valve Timing

***Clinic Length: Approx. 3 hours – minimum of 25 attendees**

This clinic will focus on the different types of variable valve timing (VVT) systems used by vehicle manufacturers today. After multi-valve technology became standard in engine design, VVT became the next step to enhance engine output, increasing engine power and torque output along with reducing emissions. Without VVT technology, engineers previously had to choose the best compromise in valve/cam timing and ended up sacrificing one thing to gain in another area. VVT allows the best of both worlds – increased performance and economy and lower emissions. There are a multitude of Diagnostic Trouble Codes (DTCs) that can set related to VVT faults stemming from oil contamination to inoperative cam actuators and oil control solenoids. We explain the variations of VVT systems used by manufacturers today and look at diagnostic tests that can be performed on this system using the scan tool and other diagnostic equipment to confidently diagnose these systems before the costly and labor-intensive engine teardown for service.

After completing this clinic, the student will have the knowledge to:

- Identify the VVT system types used by manufacturers
- Understand the VVT DTC stored in the Powertrain Control Module (PCM)
- Relate to the scan tool parameters used by various manufacturers to validate camshaft control and operation
- Realize the importance of lab scope testing to validate camshaft to crankshaft correlation
- Perform mechanical engine tests with a variety of test equipment to avoid timely engine teardowns for diagnostic purposes
- Utilize new scan tool information and techniques to reduce diagnostic time in the service bay for VVT related faults or symptoms

 Available in Spanish • Disponible en español

CAN Networks

***Clinic Length: Approx. 3 hours – minimum of 25 attendees**

Since many newer vehicles can have 30 or more onboard computers, this clinic helps technicians understand, identify and diagnose CAN (Controller Area Network) vehicle communication networks. We review network fundamentals to help the technician understand the need, strategy and protocol of CAN. To aid in diagnostics, various types of network topologies are reviewed and explained. To help pinpoint CAN failures, several electrical circuit integrity test methods are outlined to validate root cause of CAN communication failures. Application of the diagnostic strategies are highlighted through vehicle Case Studies shown throughout this seminar.

After completing this clinic, the student will have the knowledge to:

- Identify Network type and topology
- Utilize the proper tools and test procedures when diagnosing network fault
- Diagnose ‘U’ code failures on CAN networks
- Test for ‘No Communication’ faults on CAN networks

Evaporative Emissions Diagnostics

***Clinic Length: Approx. 3 hours – minimum of 25 attendees**

This clinic is designed to aid technicians in the understanding of how to diagnose and repair today’s Evaporative Emission Control Systems. We will cover several types of Enhanced Evaporative Emission systems with a focus placed on Leak Detection Pumps (LDP) and Evaporative System Integrity Modules (ESIM). We will also discuss operating strategies for Engine Off Natural Vacuum (EONV) systems and Natural Vacuum Leak Detection (NVLD) systems. Leak testing procedures using smoke test equipment will be reviewed and discussed. Diagnostic methods for quickly pinpointing the cause of common EVAP DTC’s will be highlighted. DTC interpretation defining electrical and mechanical component faults will be reviewed to aid in streamlining diagnostic processes.

After completing this seminar, the student will have the knowledge to:

- Identify the type of enhanced EVAP system being diagnosed
- Use the OBD II monitors to aid in diagnosis and testing
- Utilize scan tool bi-directional controls for testing
- Test for small and large EVAP leaks using smoke tests
- Determine the most effective and time saving ‘next step’ in the diagnostic process

Gasoline Direct Injection Systems

***Clinic Length: Approx. 3 hours – minimum of 25 attendees**

This clinic provides a comprehensive overview of GDI engines. Various engine operating modes (start-up injection, late injection, operating mode transition) are explored. An explanation of mixture preparation leading to the combustion process is outlined. An emphasis on operational strategies for both homogenous and stratified charge fuel control is reviewed. Issues related to the direct injection of gasoline into the combustion chamber are highlighted. Fuel injection system requirements for optimal spray characteristics are discussed. Testing methods of the high pressure fuel pump and control valve using scan tool PIDs is a focus of this course. GDI injector servicing concerns and recommended procedures, as well as best diagnostic practices, will be shared.

After completing this seminar, the student will have the knowledge to:

- Discuss GDI vehicle service recommendations
- Properly service and diagnosis GDI injectors
- Diagnose and test the high pressure fuel system using the scan tool
- Evaluate pertinent scan tool data and fault codes related to Hybrid vehicles
- Perform lab scope testing on GDI injectors and interpret testing results

 Available in Spanish • Disponible en español

Introduction to J2534 Programming

***Clinic Length: Approx. 3 hours – minimum of 25 attendees**

This clinic focuses on providing information to technicians about J2534 pass thru programming processes. Reprogramming modules on today's vehicles can be required for a number of reasons. We will discuss how to find and navigate service information websites, both aftermarket and OE. This clinic discusses J2534 programming interfaces and will help technicians decide if module programming is right for them and will suit their shop's needs. Step by step processes for re-programming existing modules, as well as programming NEW modules will be discussed. Several step-by-step module programming examples will be provided.

After completing this seminar, the student will have the knowledge to:

- Properly inspect the vehicle to see what module updates are needed
- Locate J2534 vehicle programming resources
- Purchase OE subscriptions and set up a J2534 interface
- Determine what vehicle programming platform is best for them

Turbochargers and Induction Systems

***Clinic Length: Approx. 3 hours – minimum of 25 attendees**

This clinic is designed to help technicians develop a tactical process that will help improve productivity in the service bay and establish diagnostic confidence in an ever-changing automotive world. Today's vehicles have Induction systems which often include systems such as IMRC (intake manifold runner control) to boost engine efficiency. Taking things a step further on the induction side, many manufacturers have shifted to smaller, more efficient engines with Turbochargers utilizing electronic wastegate and bypass control components. Fundamentals and operation of the basic components will be discussed. We will take a deep dive into the control strategies while demonstrating proven diagnostic and testing methods. This seminar uses several vehicle case studies to help explain and pinpoint engine performance related problems.

After completing this seminar, the student will have the knowledge to:

- Properly inspect IMRC (Intake Manifold Runner Control) components
- Interpret sensor data used in turbocharged applications
- Identify components and operation of turbocharged vehicles
- Validate boost leaks within a turbocharged system
- Diagnose low power concerns as they relate to the turbocharger system

**Call your sales representative for pricing*

ES Available in Spanish • Disponible en español

Advanced Oscilloscope Engine Testing

***Clinic Length: Approx. 3 hours – minimum of 25 attendees**

This clinic will focus on the different types of electronic engine diagnostic procedures used to diagnose today's engines. Both in-cylinder pressure transducers and manifold vacuum transducers used with a digital storage oscilloscope (DSO) can reduce valuable diagnostic and teardown time on today's VVT equipped multi-cam engines. Engine performance and emissions can be severely impacted by cam timing concerns caused from lack of oil, failed timing chain tensioners and/or stretched timing chains or belts. Volumetric efficiency reductions caused by lack of air flow concerns from restrictions in the intake or exhaust systems can cause Low Power concerns. Engine compression issues can be significant in size or very small, almost undetectable at times, leading to misfire DTCs. Relative compression testing can reduce the time it takes to validate a compression issue on an engine. These types of problems can skew the diagnostic information in the scan tool and can make it unreliable or unclear. In this clinic you learn the benefits of using modern diagnostic equipment and when to use these testing techniques.

After completing this clinic, the student will have the knowledge to:

- Identify what tests to apply to accurately pinpoint the cause of engine performance concerns such as lack of power, run roughs, air leaks and engine misfire
- Perform relative compression tests using both scan tools and lab scopes with a high amp current probe
- Perform mechanical engine testing and diagnosis using electronic pressure transducers
- Validate engine camshaft to crankshaft correlation accurately using lab scope tests
- Utilize new scan tool information and techniques to reduce diagnostic time in the service bay for VVT related faults or symptoms

**Call your sales representative for pricing*

ES Available in Spanish • Disponible en español

Asian Driveability ***Clinic Length: Approx. 3 hours – minimum of 25 attendees**

This all-new Asian vehicle training seminar is the latest addition to our Engine Performance offering, and continues the evolution of our curriculum from a systems-based layout to a diagnostics-based layout. We differentiate new and legacy engine management systems, changing the way you approach Asian vehicles. Emphasis is placed on today's smaller GDI (Gasoline Direct Injected) turbocharged engine platforms. Turbocharger control and dual GDI/MPFI injection system operation strategies are shared. We will look at a variety of high-level indicators related to driveability faults, streamlining the time it takes you to find the root of a problem. We will discuss performing non-intrusive timing testing without labor intensive teardowns. Helpful Fuel Trim diagnostic tips are discussed to prevent you avoid being misled. Rear Fuel Trim Faults and Fueling Strategies are covered and we will also discuss Air:Fuel Sensor operation and best testing practices. OE strategies used when diagnosing CMP/CKP faults and Misfire diagnostics are presented. Lastly, we look at the operation of the latest Evaporative Emissions Systems.

After completing this seminar, the student will have the knowledge to:

- Diagnose Check Engine Light concerns on Asian vehicles
- Evaluate low power engine performance related concerns
- Analyze scan tool data parameters pertaining to engine performance
- Utilize scan tool and lab scope testing methods to isolate sensor faults
- Validate turbocharger, VVT (variable valve timing), variable cylinder displacement and GDI (Gasoline Direct Injection) system performance

IGNITION**Ignition System Testing** ***Clinic Length: Approx. 3 hours – minimum of 25 attendees**

This clinic is designed to enhance the professional level technician's knowledge of modern ignition system diagnostics. P0300 misfire DTC diagnostic strategies are covered using modern scan tools and ignition system test equipment. Information covered reviews digital storage oscilloscopes (DSOs) patterns captured using current probes, inductive wands and voltage test leads to validate modern ignition system components ranging from crankshaft and camshaft position sensors to today's COP (Coil on Plug) assemblies. Misfire information obtained from the scan tool is explained and reviewed through Case Study vehicles. PCM (Powertrain Control Module) operational strategies are defined pertaining to OBD II Misfire Monitoring standards.

After completing this clinic, the student will have the knowledge to:

- Recognize different manufacturers' operational strategy during misfire conditions
- Identify PCM strategies that prevent catalytic converter damage due to Type A misfires
- Accurately test crankshaft position and camshaft position sensors
- Distinguish the difference in testing procedures for conventional ignition coils versus 'smart coil' assemblies
- Interpret various ignition component waveforms captured from a DSO (Digital Storage Oscilloscope)
- Understand fuel trim corrections during misfire conditions to isolate system faults

How to Use Your Lab Scope for Diagnostics ***Clinic Length: Approx. 3 hours – minimum of 25 attendees**

In this clinic, we will present how to set up and operate a lab scope for the purpose of testing automotive sensors and components of various types. As the saying goes, "A picture is worth a thousand words." We cover set up procedures, voltage and time base settings, and waveform capturing techniques. Waveforms captured from many different component types are reviewed to differentiate 'good' and 'bad' waveforms. A color clinic book is provided showcasing popular aftermarket lab scope waveforms for take home reference.

After completing this clinic, the student will have the knowledge to:

- Set up and capture automotive waveforms using a lab scope
- Configure lab scope settings for optimized viewing of waveforms
- Properly connect a lab scope to various solenoids, actuators, speed and position sensors and DC motors found under hood and undercar
- Identify when going for the lab scope is necessary
- Utilize multiple channels of the lab scope to aid in diagnostic situations

ELECTRICAL

Body Electrical

***Clinic Length: Approx. 3 hours – minimum of 25 attendees**

This clinic is designed for technicians who already have a solid electrical foundation and are looking to understand today's vehicles complex body electrical systems. Covered within this workshop will be multiplex network communications and network system diagnostics. We will look at network topology for various body electrical systems and discuss how system modules and components interact with one another. Communication 'gateways' and module diagnostics will be discussed. This course will take a deep dive into several BCM (body control module) controlled systems and will discuss diagnostic strategies using the scan tool, DMM's and lab scopes to pinpoint test and located problems.

After completing this seminar, the student will have the knowledge to:

- Analyze and test various network signals and components on the vehicle
- Diagnose and test many different vehicle body control systems (lighting, doors, security, etc.)
- Replace and program (set up) a Body Control module or Gateway module
- Understand body control system operation strategies
- Employ scan tool usage in conjunction with electrical circuit tests using a DMM or lab scope

Battery, Starting and Charging System Diagnostics

***Clinic Length: Approx. 3 hours – minimum of 25 attendees**

This clinic is for technicians who have a basic understanding of electrical theory and are ready to put it to use. We begin with highlighting information on battery testing and battery replacement. We will discuss proper battery testing methods and what may need to be done during a replacement. Starting systems have become more efficient and the circuits to control them include complex security protocols. The methods for validating faults within a starter circuit still revolve around the understanding of basic electricity. Good practices are critical to not overlooking an obvious fault. We will cover how to diagnosis a 'no start' condition and what the quickest way is to pinpoint the problem. Charging system controls have advanced and many manufacturers have specific charging system strategies that are used to aid in longer battery life and help to increase economy. We discuss the different variations of 'smart charging systems' and what testing methods you need to employ to avoid replacing a costly alternator that was not the root of the problem.

After completing this clinic, the student will have the knowledge to:

- Diagnose common battery, starting, and charging issues using the latest diagnostic equipment
- Understand the different automotive battery types and testing methods
- Measure charging system output and validate proper PCM control
- Use system wiring schematics to aid in diagnosing charging system faults

Push Button Start and Smart Key Access

***Clinic Length: Approx. 3 hours – minimum of 25 attendees**

This clinic enhances the skills of the professional technician in the area of push-button start, smart keys and start/stop systems. All of these systems are integrated together and can have an impact on one another. This course will discuss tricks in navigating service information to find necessary information for diagnosing a 'no-start' or no 'power up' condition. We will highlight various methods to allow scan tool communication with relevant modules in the event of a dead fob, or a failed start button. Wiring schematic information is highlighted throughout to understand diagnostic strategies. We will review communication networks, security gateways and talk through all of the system checks necessary to power and start and run the vehicle.

After completing this seminar, the student will have the knowledge to:

- Source wiring schematics relevant to vehicle starting systems using smart keys
- Identify root causes for a vehicle 'no-start' or 'no power up' condition
- Understand the hardware and electrical circuit control for start-stop systems
- Analyze related electronic systems that interact with the push button start system
- Understand the role the security system plays in starting the vehicle

Automatic Transmission Diagnostics

***Clinic Length: Approx. 3 hours – minimum of 25 attendees**

In this clinic we discuss how to validate if the transmission is at fault or if there is a problem outside of transmission itself, such as a sensor, wiring or control module failure. Whether you're a transmission specialist or not, we all share a common problem in the service bay – How to efficiently diagnose the root cause of a transmission code or complaint in a reasonable time. This is even more important for modern, integrated drivetrains where driveability problems are often transmission-related, and transmission complaints often end up being engine-related. We will discuss application charts to map out power flow to determine what components are being used under fault conditions. We highlight methods to effectively test sensors, switches and solenoids under loaded conditions while leveraging scan tool PIDs and function tests to eliminate the most possible causes. We discuss several case studies to emphasize the point of using strategic diagnostic practices whether you rebuild transmissions or just recommend replacing one.

After completing this seminar, the student will have the knowledge to:

- Identify internal or external failures on transmission related concerns
- Differentiate engine fault condition from those within the auto transmission/driveline
- Perform electrical circuit and component validation tests
- Understand transmission electrical components and their function

Intro to Electric Vehicles 

**Clinic Length: Approx. 3 hours – minimum of 25 attendees*

This clinic provides easy to understand information about how an actual electric vehicle works. Reducing or eliminating emissions is high priority for vehicle manufacturers. One way to achieve this goal is increase the number of zero emission vehicles on the road. California has a zero-emission mandate and China has also adopted a version of California's plan in its new energy mandate. BEV production numbers are on the rise and are soon going to be commonplace. The time is here to start learning about BEV's and preparing for this fundamental shift in automotive technology. This clinic will present a solid overview of components, operation and the tooling you will need to successfully compete in the BEV market. We will discuss BEV (Battery Electric Vehicle) battery packs, invertors, converters, electric motors, normal-safe service procedures, and the various modules that control the vehicle's electrical systems.

After completing this seminar, the student will have the knowledge to:

- Invest wisely in the special tools required for service of BEV's
- Recognize common components shared between Hybrids and BEV's
- Identify components found only on BEV's
- Understand battery construction, cooling and testing methods
- Recognize power flow through the BEV drivetrain

STEERING AND SUSPENSION**Diagnosing Steering and Suspension Systems from A to Z** 

**Clinic Length: Approx. 3 hours – minimum of 25 attendees*

This clinic enhances the skills of the professional undercar technician in the areas of mechanical and electronic steering and suspension systems. We discuss proper component inspection procedures on today's popular suspension and steering systems. Vehicle diagnostic strategies revolving around ride quality and handling issues are a focus with an emphasis on electronic shocks and air springs used on vehicles with ECS (Electronically Controlled Suspension). A description, operation and diagnostic segment on electric steer vehicles is included. Integration of these components within modern day safety systems result in special wheel alignment procedures after 'hard part' replacement. We discuss how to perform this service the 'right way' to restore proper vehicle handling and control. Calibrating various steering and suspension components after replacement is highlighted.

After completing this clinic, the student will have the knowledge to:

- Relate worn chassis components to accelerated tire wear and inadequate steering, stopping and stability
- Define the operation of electronically assisted steering systems (column drive, rack motor drive, belt drive)
- Validate performance of steering and suspension components on ECS equipped vehicles
- Understand the function and calibration needs of the Steering Angle Sensor (SAS) within various vehicle safety systems
- Recognize scan tool functional tests, data stream interpretation and output controls to complete electronic steering and suspension service procedures

Advanced Alignment Diagnostics 

**Clinic Length: Approx. 3 hours – minimum of 25 attendees*

This clinic enhances the skills of the professional undercar technician in the area of advanced wheel alignment. It covers suspension and steering diagnosis due to bent parts from accidents and road hazards, vehicle modifications, tire/wheel resizing and height issues. A review of basic alignment angles followed by thorough explanation of steering axis inclination (SAI), included angle (IA), scrub radius and toe out on turns (TOOT) will assist the alignment technician in utilizing the aligner as a diagnostic tool. Related electronic systems are also covered in this course. Vehicle component inspection and customer communication skills are necessary traits for any successful alignment tech and the importance of these skills are stressed in this class.

After completing this seminar, the student will have the knowledge to:

- Utilize the alignment machine as a diagnostic tool for the alignment and repair of vehicles involved in road hazard incidents and vehicle collisions
- Identify root causes for uneven or erratic tire wear and handling problems. Effectively communicate the results to the vehicle owner
- Identify how vehicle modifications and tire/wheel changes affect alignment and dynamic operation
- Analyze related electronic systems that interact with the chassis system in need of recalibration or adjustment after the alignment procedure

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 Available in Spanish • Disponible en español

Advanced Driver Assistance Systems (ADAS)

**Clinic Length: Approx. 3 hours – minimum of 25 attendees*

This clinic focuses on educating technicians on the fast growing technical area of Advanced Driver Assistance Systems technology used on many vehicles. Systems such as blind spot monitoring, adaptive cruise control, collision avoidance, lane departure warning, lane keep assist, side-view cameras and 360° camera use will be discussed. We will highlight calibration methods for these systems within the class showcasing real-world procedures pre and post repair. A primary area of focus will be on where to find relevant information and what equipment is needed to perform these calibrations. Simply connecting a scan tool and clearing the lights that are on in the instrument cluster is not the answer, performing proper calibrations are.

After completing this seminar, the student will have the knowledge to:

- Understand forward facing camera calibration procedures
- Diagnose ADAS system malfunctions related to braking concerns
- Test proximity and ultrasonic sensors
- Identify resources, information and tools necessary to complete ADAS calibration procedures
- Understand forward radar sensor calibration procedures
- Analyze related electronic systems that interact with the ADAS system in need of recalibration or adjustment after the alignment procedure

HYBRID

Hybrid Vehicle Service and Diagnostics

**Clinic Length: Approx. 3 hours – minimum of 25 attendees*

This clinic is designed to expand the technician's ability to diagnose Hybrid vehicle high voltage systems and batteries. It will also include information on the Hybrid motor/generator functions, including purpose and testing parameters. Inverter technology and operation principles will be discussed with an emphasis placed on using scan tool diagnostic PIDs best used to check for problems within. We will discuss Hybrid drive systems commonly being used today by various manufacturers, including the Type 1 (series), Type 2 (parallel) and Type 3 (series/parallel) systems with an emphasis placed on power flow and testing. Lastly, we discuss Hybrid vehicle maintenance, service, and safety considerations and what advancements in technology are headed into your service bays.

After completing this seminar, the student will have the knowledge to:

- Discuss Hybrid safety protocols within their service bays
- Properly service and diagnose the high-voltage battery systems
- Diagnose and test the Hybrid drive, motor/generator and Inverter on the vehicle
- Properly inspect and test the vehicle's brake system to see if the regeneration system is working
- Evaluate pertinent scan tool data and fault codes related to Hybrid vehicles

**Call your sales representative for pricing*

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DIESEL

Light Duty Diesel Emissions Systems

**Clinic Length: Approx. 3 hours – minimum of 25 attendees*

This clinic is designed to enhance the technician's ability to diagnosis and repair emissions systems on light duty diesel trucks. We will review diesel emission protocols which have been in place since the 2011 model year as they relate to the light duty diesel truck market. Operational strategies describing regeneration and DEF (Diesel Exhaust Fluid) systems will be covered. We will focus on EGR (exhaust gas recirculation) systems and various exhaust sensors (DPFS, NOx, AFS, EGT) that are used on these light duty diesel trucks to control emissions. Aftertreatment systems including the DOC (Diesel Oxidation Catalyst), the NAC (NOx Adsorber Catalyst), the SCR (Selective Catalyst Reduction), and the DPF (Diesel Particulate Filter) are discussed in detail.

After completing this seminar, the student will have the knowledge to:

- Properly service light duty diesel truck emission' systems
- Diagnose a multitude of DTC's pertaining to aforementioned exhaust systems
- Discuss Regeneration strategies and the role DEF plays within
- Properly inspect and test all the exhaust sensors used within these complex emissions systems
- Evaluate scan tool data and fault codes through vehicle Case Study examples

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HEAVY DUTY COURSES



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HEAVY DUTY TRAINING WORKSHOPS

The in-class workshop experience allows students to work hand-in-hand with a Garage Gurus HD Master Trainer at one of our conveniently located Technical Support Centers (TSCs).

HD Foundation Brake Workshop

Workshop Length: 4 hours – 8 student maximum

This workshop is designed with a combination of classroom and hands-on education to enhance the technician’s ability to properly diagnose and service Heavy-Duty Truck Foundation Brakes. Emphasis is placed on defining CVSA (Commercial Vehicle Safety Alliance) Out-of-Service Criteria. In addition, we define the function of the brake system components. We overview diagnostic procedures used to understand air balance, mechanical balance, torque balance and friction balance.

After completing this workshop, the student will have the knowledge to:

- Properly identify foundation brake components and their function
- Understand Out-of-Service conditions and repairs
- Identify failed components and repair procedures
- Perform measurements on foundation brake components

HD Air Disc Brake Workshop

Workshop Length: 4 hours – 8 student maximum

This workshop emphasizes classroom and hands-on experience to increase the technician’s ability to properly diagnose and service Heavy-Duty Air Disc Brakes. We discuss CVSA (Commercial Vehicle Safety Alliance) Out-of-Service Criteria and define the function of the disc brake system components. We highlight the understanding air balance and friction balance.

After completing this workshop, the student will have the knowledge to:

- Properly identify air disc brake components and their function
- Understand Out-of-Service conditions and repairs
- Identify failed components and repair procedures
- Perform brake related measurements

HD Bearings and Seals Workshop

Workshop Length: 4 hours – 8 student maximum

This workshop is designed with a combination of classroom and hands-on education to enhance the technician’s ability to properly diagnose and service wheel end bearings and seals. We define the function of bearings, seals and hubcaps. We focus on proper removal, cleaning and installation procedures. We perform proper end play torque procedures.

After completing this workshop, the student will have the knowledge to:

- Properly identify wheel end components and their function
- Identify failed components and repair procedures
- Perform bearing adjustment
- Understand end play

HEAVY DUTY FIELD CLINICS

The field clinic brings the Garage Gurus HD ASE Certified Master Trainer to the technician’s location.

HD Foundation Brake Clinic

Course Length: 3 hours

This clinic is designed to enhance the technician’s ability to service Heavy-Duty Truck Brakes. We discuss components, service procedures, diagnostic procedures and out of service criteria. Emphasis is placed on brake balance.

After completing this clinic, the student will have the knowledge to:

- Properly service foundation brakes
- Inspect and identify component failure modes
- Utilize the proper service tools

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ASE A4 Test Prep for Steering and Suspension
ASE A5 Test Prep for Brakes
ASE A6 Test Prep for Electrical and Electronic Systems
ASE A7 Test Prep for Heating and Air Conditioning
ASE A8 Test Prep for Engine Performance
ASE A9 Test Prep Light Diesel
ASE G1 Automotive Maintenance and Light Repair
ASE L1 Advanced Engine Performance

Workshop Daytime Courses – 8 Hours (1 Day)
Advanced Oscilloscope Engine Testing
Ignition System Failures and Diagnostics
CAN Networks
Hands-On Electrical Testing

Workshop Daytime Courses – 16 Hours (2 Days)
Automotive Electronics

Workshop Evening Courses – 4 Hours
Electronic Brake Control (EBC) Systems
Engine Performance Diagnostic Strategies
Gasoline Direct Injection
Understanding CAN Networks
Hands-On Electrical Diagnostics
Analyzing Today's Ignition Systems
How to Use Your Lab Scope
Service Writer – Steering & Suspension
Service Writer – Brakes

Field Clinics – 3 Hours
Brake System Technology
Engine Performance Diagnostic Strategies
Diagnosing Variable Valve Timing
CAN Networks
How to Use Your Lab Scope for Diagnostics
Ignition System Testing
Diagnosing Steering and Suspension Systems from A to Z
Evaporative Emissions Diagnostics
Gasoline Direct Injection Systems
Hybrid Vehicle Service and Diagnostics
Body Electrical
Light Duty Diesel Emissions Systems
Advanced Alignment Diagnostics
Advanced Driver Assistance Systems (ADAS)
Modern Induction Systems
Advanced Oscilloscope Engine Testing
Battery, Starting and Charging System Diagnostics
Push Button Start, Start/Stop and Smart Key
Automatic Transmission Diagnostics
Asian Driveability
Intro to Electric Vehicles

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VIRTUAL FIELD CLINICS



We've optimized our **most in-demand Field Clinic topics**, now available in our new virtual format. Straight from our technical service center bays, our virtual training platform utilizes a unique combination of **hands-on vehicle demonstrations and in-class lecture presentations**. This brings the experience of in-person training, and the value of in-class teaching, straight to all devices. These courses are **created exclusively by our Master Training team**, intended to educate and grow technician and service provider's real-world skills in a number of different areas.

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Electronic Power Steering Explained

Course Length: 2 hours

Steering Systems have evolved from hydraulic pump assisted steering gears to modern EPS (electric power steering) designs that can provide various levels of assist while driving. This Clinic:

- Enhances student's knowledge of steering systems on both electro-hydraulic and electronic assist units
- Discusses each system's component operation and outlines the strategies of operation

Engine Performance Diagnostic Strategies

Course Length: 2 hours

Stay up to date on changing Engine Management Systems, diagnostic tools, and strategies for Asian and Domestic vehicles. This Clinic:

- Reviews and demonstrates the most frequently seen emissions-based DTC (Diagnostic Trouble Codes) diagnostic routines
- Improves proficiency in interpreting Scan Tool information for engine performance diagnostics
- Provides live demonstrations of diagnostic strategies!

CAN Networks Explained

Course Length: 2 hours

Learn how to understand, identify and diagnose CAN (Controller Area Network) communication networks with hands-on demonstrations! This Clinic:

- Reviews network fundamentals to help the technician understand the strategy and protocol of CAN
- Explains several electrical circuit integrity testing methods to validate root causes of CAN failures
- Provides live demonstrations of diagnostic strategies!

Diagnostic Alignment Angles

Course Length: 2 hours

Enhances the skills of the professional undercar technician in the area of advanced wheel alignment. This Clinic:

- Covers steering and suspension diagnosis due to bent parts from accidents and road hazards, vehicle modifications, tire/wheel resizing and height issues
- Reviews basic alignment angles, thorough explanation of: steering axis inclination (SAI), included angle (IA), scrub radius and toe out on turns (TOOT)
- Provides live demonstrations of diagnostic strategies!

All You Need to Know About Gasoline Direct Injection

Course Length: 2 hours

Providing a comprehensive overview of GDI engines, this Clinic:

- Explores various engine operating modes (start-up injection, late injection, operating mode transition)
- Highlights issues related to the direct injection of gasoline into the combustion chamber
- Provides live demonstrations of diagnostic strategies!

 Available in Spanish • Disponible en español



Understanding Variable Valve Timing

Course Length: 2 hours

After multivalve technology became standard in engine design, variable valve timing (VVT) became the next step to enhance engine output, increasing engine power and torque output along with reducing emissions. This Clinic:

- Focuses on the different types of VVT systems used by vehicle manufacturers today, and the various Diagnostic Trouble Codes (DTCs) that can occur related to VVT faults stemming from oil contamination to inoperative cam actuators and oil control solenoids
- Provides live demonstrations of diagnostic strategies!

Diesel Performance for the Gasoline Technicians

Course Length: 2 hours

Gaining insight to modern diesel engine control systems can be challenging for technicians that are not familiar with the technologies used in light duty diesel powered vehicles. In this clinic we will bridge the gap between gasoline engine system operating strategies and those of light duty diesels. This Clinic:

- Discusses operation of EGR systems, Fuel System components and turbochargers
- Enhances student knowledge of diesel exhaust systems and components as they pertain to emission control

How to Prevent Brake Comebacks

Course Length: 2 hours

Learning proper service techniques are important to ensure safe operation of the vehicle. During this clinic we will identify 'do's and don'ts' when performing a brake service. This Clinic:

- Provides insight on how to perform basic brake service procedures
- Focuses on caliper and rotor preparation to ensure quiet brake system performance without comeback!

Electrical Diagnostics Level 2

Course Length: 2 hours

In this clinic we will focus on applying electrical theory to vehicle diagnostics. DMM (digital multimeter) tests are demonstrated on various sensors and components. This Clinic:

- Discusses how to test and measure duty cycle outputs
- Defines testing procedures for 2 and 3 wire sensors
- Explains how to test amperage draw on DC motors and other circuits

ADAS (Advanced Drivers Assist Systems) Part 1 – Introduction

Course Length: 2 hours

In this clinic we will define the components and the strategy used within these systems. Identifying components, finding where they are located, and understanding how to interpret the information they provide will be discussed. This Clinic:

- Reviews terminology and the differences amongst ADAS
- Explains how the vehicle's braking and steering system interconnects with ADAS

ADAS (Advanced Drivers Assist Systems) Part 2 – Servicing

Course Length: 2 hours

In this clinic we will discuss what 'static' and 'dynamic' calibrations of the system include and when they are needed. We will also discuss the tools needed to complete the service accurately and efficiently. This Clinic:

- Explains how to calibrate the vehicle's ADAS radar and cameras
- Defines the difference in procedures between a 'static' and a 'dynamic' calibration

Emission System Diagnostics

Course Length: 2 hours

In this clinic we will discuss best diagnostic practices for the common emissions related DTC's P0420/P0430 (Catalytic Converter Inefficiency). Scan tool diagnostic strategies, as well as 5 gas analysis procedures are defined. This Clinic:

- Discusses how to quickly and accurately diagnose emissions related trouble codes
- Explains catalytic converter operation and best testing practices

J2534 Programming

Course Length: 2 hours

This clinic will discuss the hardware and software requirements needed for vehicle module programming. The instructor will discuss:

- Computer requirements
- Different types of Programming tools
- Battery chargers vs maintainers, and the importance of using the correct one
- Live module programming walkthroughs

Brake System Technologies

Course Length: 2 hours

This clinic is designed to enhance the technician's ability to perform proper brake service procedures on today's vehicles utilizing Electronic Brake Control (EBC) systems. The instructor will discuss:

- Active Safety Systems and the operational strategies used on many new vehicles
- Stability control operation and the modern advancements within this safety technology

Modern Day Ignition Diagnostics

Course Length: 2 hours

Ignition system operation can vary from vehicle to vehicle. In this clinic we will review various ignition coils and system types and discuss what methods can be used for proper diagnosis and testing. This Clinic:

- Explains how to validate the ignition system is working properly using a scan tool and a DSO (digital storage oscilloscope)
- Reviews misfire detection strategies used by manufacturers
- Identifies CKP (crank sensor) and the CMP (cam sensor) relationships

How to use Your Lab Scope

Course Length: 2 hours

This clinic will discuss how to use an Oscilloscope for diagnostic testing. The instructor will discuss:

- Proper set up of time and voltage scaling, different leads and probes and when to use them
- Known good and bad waveforms
- Live, on-car oscilloscope testing

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Dave Cerveny | Home TSC: Skokie, IL

Certifications:

- ASE-Certified Master Technician
- ASE L1 Advanced Engine Performance Specialist

Experience:

Over 35 years, including 15 years in the aftermarket repair business as an ASE technician and over 15 years in the automotive education field as an instructor/trainer.

John Dixon | Home TSC: Skokie, IL

Certifications:

- ASE-Certified Master Technician
- ASE L1 Advanced Engine Performance Specialist
- Bachelor's Degree in Business Management

Experience:

Over 25 years in the automotive industry where he has worked as both a technician and trainer.

Mark Ingram | Home TSC: St. Louis, MO

Certifications:

- ASE-Certified Master Technician
- ASE L1 Advanced Engine Performance Specialist
- ASE L2 Electronic Diesel Engine Diagnosis
- ASE L3 Light Duty Hybrid/Electric Vehicles
- Master's Degree in Workforce Education Development

Experience:

Over 44 years in the automotive industry as both an aftermarket technician/trainer and 15 years as an OEM technician/trainer.

Mark Isaac | Home TSC: St. Louis, MO

Certifications:

- ASE-Certified Master Technician
- Bachelor's Degree- Automotive Technology SIU-Carbondale

Experience:

35 years in the automotive industry working as a technician and instructor.

Mark Kenyon | Home TSC: St. Louis, MO

Certifications:

- ASE-Certified Master Technician
- ASE-Certified Master Engine Machinist

Experience:

Over 40 years in the automotive industry where he has worked as a professional engine builder and engine machinist, automotive technician and automotive instructor.

Gary Kimball | Home TSC: Dallas, TX

Certifications:

- ASE-Certified Master Technician
- ASE L1 Advanced Engine Performance Specialist

Experience:

Over 30 years in the light truck and automotive industry. He has worked as technician, service advisor, manager and trainer, and has been an ASE Master L1 certified tech for 25 years.

Bill McAleese | Home TSC: Baltimore, MD

Certifications:

- ASE-Certified Master Technician
- ASE L1 Advanced Engine Performance Specialist
- ASE-Certified Undercar Specialist
- ASE-Certified Medium/Heavy Truck Mechanic
- ASE-Certified Parts & Service Consultant

Experience:

Over 30-year automotive career where he has progressed from parts counter person to master technician and currently to shop owner and master trainer.

Ryan Payne | Home TSC: Atlanta, GA

Certifications:

- ASE-Certified Master Technician
- ASE L1 Advanced Engine Performance Specialist

Experience:

Professional career spans over 25 years in the automotive industry where he has worked as both a technician and trainer.

Damian Rodriguez | Home TSC: St. Louis, MO

Certifications:

- ASE-Certified Master Technician

Experience:

Over 20 years in the automotive industry where he has worked as both a technician and trainer.

CONTENT TEAM

Tim Habel

Certifications:

- ASE-Certified Master Technician
- ASE L1 Advanced Engine Performance Specialist
- ASE L2 Electronic Diesel Engine Diagnosis
- ASE L3 Light Duty Hybrid/Electric Vehicles
- GM Master Technician Certified
- Associate's Degree in General Business, Automotive Technology certificate

Experience:

Over 29 years of automotive industry experience, with 15 years of experience as an automotive trainer, and over 14 years as an automotive technician within the independent automotive aftermarket.

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