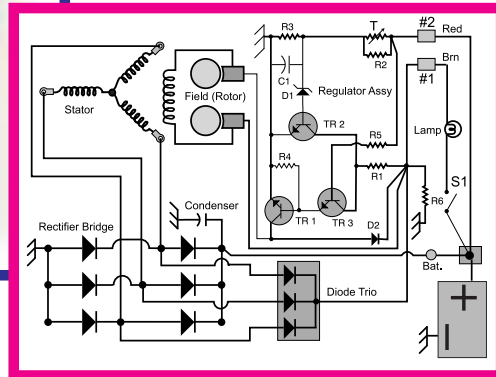


IN-SERVICE TECHNICIAN TRAINING PROGRAMS



"We're Proud of Our Blue Seal Tests"

Course Catalog

31 Fairview Road
Medford NJ 08055
856-810-4075



Accredited Training Provider

EAST Training Inc.

The right information... to the right technician... at the right time!

Mission Statement

EAST's mission is to provide convenient, accurate, timely, and enjoyable, leader-led training for professional in-service technicians. Training that is performance-based and measurable by an increase in the technicians' knowledge, productivity, profitability, and quality of repair services offered.



**The EAST Core Curriculum Programs were
Awarded the Automotive Training Managers Council
“Excellence In Training” Award**

EAST curriculum is designed for professional, in-service technicians with a minimum of 2 years field experience. Prerequisites are noted where applicable. Pre and post course testing is conducted where appropriate.

Enhanced Automotive Systems Technology



You are invited to participate in the most advanced, and comprehensive technical training program available to aftermarket industry repair shops. Courses are presented by Enhanced Automotive Systems Technology Inc., an award winning New Jersey based training company that has acquired a reputation for quality hands-on training up and down the East coast, from Maine to Florida.

EAST has providing quality *performance-based* training to independent shops, OEM dealers, industry associations, municipal and state fleets, parts and equipment companies, mass merchandiser chains, Vo-Tech schools, and community colleges since 1998.

EAST employs full time trainers (Not part time contract trainers!) with many years of experience repairing cars and training. Training, not only professional technicians, but also *professional instructors*.

EAST provides T³ (train-the-trainer) services to several well-known industry schools, and the United States Marine Corps. (See our website at www.easttraining.com for more on EAST and our Instructor's qualifications.)

Working out of their Research Center in New Jersey, EAST trainers and curriculum designers develop programs based on *real world* problem vehicles diagnosed in the Research Center, and student's shops. Courses are presented using PowerPoint presentations enhanced with computer animation and video clips for greater understanding of systems theory and operation. Instructors use video cameras in the classroom to enhance visual understanding. High resolution light boxes are used to project slides and video images.

Course Curriculum

Courses are *developmentally articulated*, which means that each course, and each semester, builds upon the previous. Each course contains hands-on training, either on simulators, electrical boards, electronic breadboards, or on-car demonstrations and exercises. Students will be asked to bring their own small equipment (DVOM, DSO, Scan tool etc.) depending on class subject. The instructors are experienced in the use of all major brands of equipment used in the industry and can show you many tips and techniques to get greater understanding and service out of *your* equipment to improve productivity.

Recognition

Upon completion of each course a personalized certificate will be awarded. All Classes are ASE/ATMC accredited through CASE (Continuing Automotive Service Education). If the course is successfully completed, CASE CEU's will be awarded along with a *Certificate of Achievement*. If the student attends the full course, but does not pass the final evaluation, a *Certificate of Attendance* will be awarded.

Local Training

EAST establishes local training regions, which will keep your travel to a minimum. There will be a total of 10 nights of training scheduled for the semester, presented in 2 night modules. Classes begin at 6:00 PM and conclude at 10:00 PM. Once a region has been established in your area, dates for the entire year will be provided. You will know exactly which courses are scheduled, when and where all courses will be presented. (Daytime, weekend, and T³ classes can be scheduled by special arrangement.)

Technician Skill Assessment

If you would like to establish a benchmark for your employee's present skill level to better gauge your training efforts, EAST can also provide a Skill assessment and Profiling of attendees prior to the class, at additional cost. This assessment is available in a proctored session at a convenient location, or entirely on the Internet.

Training is not expensive...
it's PRICELESS!



EAST Training Inc.

EAST Training

Technical Team Profiles

Vince Virgilio

Vince is the founder and President of EAST. He is an automotive technician turned trainer with over 20 years of hands-on experience. In the early 90's, Vince joined ASPIRE, Inc. and was instrumental in the development of the EDGE training programs – chosen for emissions training in nearly 30 states. His work at ASPIRE also became the basis for Snap-On's Emission Solutions series and Standard Motor Products' Advanced Emission Diagnosis program.

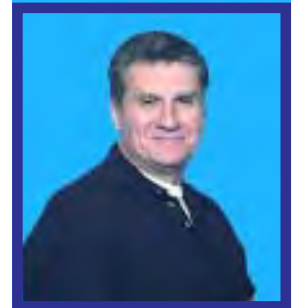


Vince holds the following certifications and credentials:

- ASE Master Technician and Advanced Engine Performance Specialist (L1) Certification
- MACS Certified Instructor
- NTTP Senior Master Instructor
- New Jersey Certified Repair Technician

Paul Whelan

With over 50 years in the industry, as a technician, diagnostic roadtester, and shop forman, Paul spent 17 years as Sr. VP, Lead Instructor; Research & Development, Production & Training Manager, and QA/QC manager for ASPIRE, Inc. He has been a pioneer in modern techniques of training in the automotive service business. He has been personally responsible for new course curriculum development and training methods being used throughout the industry. He was in charge of production for the Systems Theory, Advanced Systems Theory, Fast PASE (ASE Prep series), FIRST and EDGE, NY ATTP, National ATTP, Florida ASERT, Fluke 97 Scopemeter, Fluke 88 Programs and many others. He has written and produced training materials for clients including GM, Toyota, Honda, VW, Standard Motor Products, Exxon, Sun Electric, Snap on, Mobil, Chevron, MACS, Sunoco and others. He has written, edited and produced dozens of hours of video and numerous student training guides, and has written and contributed to automotive textbooks, trade periodicals, and SAE papers.



Paul's credentials and certifications include the following:

- ASE World Class Technician (original group of inductees 1986)
- For over 35 years held ASE Certifications in all areas (55 total)
- ASE Master Technician in 7 Master areas plus stand-alone certifications-
- Master Automobile, (w/L-1 and Undercar Specialist), Master Medium/Heavy Duty Truck, (w/L-2)
- Master Engine Machinist (Gas & Diesel), Master School Bus, Master Collision Repair/Refinishing
- Master Transit Bus Specialist, Master Truck Equipment Specialist, Alternate Fuels Technician, Certified Parts Specialist (Auto & Truck).
- President- ATMC Automotive Training Managers Council 1999-2000. Board member for 14 years, and Chaired many Committees
- GM Master Technician – 25 years
- National Train the Trainer- Senior Master Instructor
- Enhanced I/M Instructor- Pennsylvania FIRST, EDGE, EEIC
- Member of Society of Automotive Engineers- 30years
- ASE/ATMC CASE Evaluation Team Leader •ASE NATEF Evaluation Team Member
- Fall 2004 awarded ATMC "Member of the Year"

Jerry Stahl

Jerry has been involved for the past 20 years with research and development, training and technical assistance. His experience and ability over this time period have allowed him to manage a customer relations department including product sales, promotional information, database management, as well as processing national and regional automotive testing and certifications.

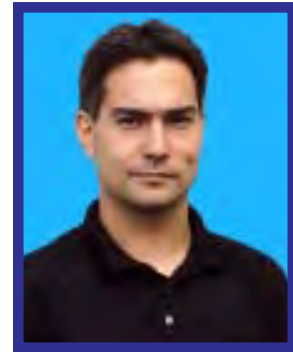


Jerry holds the following certifications and credentials:

- ASE Master Technician and Advanced Engine Performance Specialist (L1) Certification
- MACS R12 Recovery and Recycling Certification
- Senior instructor, CSCV/NERC's National Train The Trainer Program
- Service Manager - 10 years, Firestone Lead Tech – 5 years
- Allen Test Products Technician Of The Year – 5 years

Joel Martel

Trained at the Hartford Technical Institute, Joel has 5 years dealership experience (GM, Ford, Lincoln/Mercury), and 10 years in the aftermarket. Six of those years were spent as shop Forman. He was the lead trainer in West Springfield for the Massachusetts enhanced emission program, and has taught over 600 students in those programs. Joel was a student of EAST training and, for two years, assisted Vince in teaching classes in New England, before becoming a full time EAST instructor. When he is not instructing, he spends his free time diagnosing electrical, driveability, & enhanced emission failures at an emission repair center.

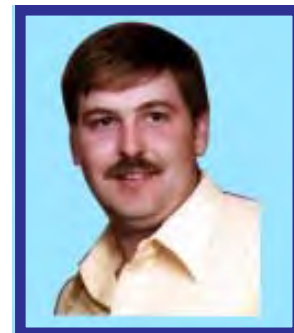


Joel holds the following certifications and credentials:

- National Train the Trainer program phase III instructor
- MA FIRST and EDGE Instructor.
- ASE Master Technician and L-1
- MA Diesel Smoke inspection trainer

Roland B. Bell JR.

Roland has over 25 Years of experience in both new car dealers and the aftermarket. He has taught for 8 Years at the Northampton Community College Bethlehem, Pa. and is an Adjunct Professor of Automotive Technologies teaching credit courses in-Engines, Brakes and Suspension Systems, Basic and Advanced Automotive Electrical and Electronics Systems, PA Inspection and Emission Certification, A/C and Heating Systems, Automotive Fuel Systems, Tune Up and Diagnostic Procedures, Automotive Mechanical Drive train Systems.



Roland holds the following certifications-

- ASE Master Automotive Technician with L1,
- RVIA/RVDA Master Recreational Vehicle Technician,
- PA certified State Safety Inspection Instructor,
- Dale Carnegie Certified.

Course Information

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Classes may be delivered in one 8 hour day, or two 4 hour evening formats

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BFRC Series

These courses were designed to be delivered in a one day, 8 hour format.

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All students successfully completing EAST Courses will be awarded CASE CEU's from ASE. (.1 CEU per hour- .8 for an 8 hour course)

EAST TRAINING

Leader-led ASE preparation classes- each course 8 Hours in length

Taught by instructors with years of experience as technicians, instructors and as ASE “test takers”. All hold a minimum status of Certified Master Automobile Technician with L1 (Advanced Engine Performance Specialist).

This is the real deal!

These courses are assembled using a “Backward Planning” approach and cover the meat & potatoes of the information needed to be successful in your efforts. If you want to be successful not only in your ASE test taking, but want to have a better understanding of system operation and be a more productive, more profitable, all around better technician, then this is for you! These programs were developed by a team of ASE Master Certified Technicians, under the guidance of an instructor holding a Master status in Automobile, Medium/Heavy truck, School bus, Engine Machinist, and Collision Repair/Refinishing, as well as, Parts Specialist, Under car Specialist, Collision repair Estimator, Service Consultant, Alternate fuels Technician, L1, L2, and “ASE World Class” status.



Recertifying Technicians

These courses are also excellent for technicians preparing to recertify who would like to take a more organized approach to preparing for the ASE tests and, at the same time, review materials pertinent to content areas and tasks which have changed since they last certified 5 years ago. New technology coverage, which has recently been added to the tests, will be covered.

Focus your test preparation on the areas you are weakest.

Technicians with many years of experience and a vast knowledge of vehicle diagnosis and repair are still not successful at acquiring ASE certification. *Why?* Passing an ASE test also involves reading comprehension and test taking skills. While these courses are heavy in technical content, other topics are covered like: how ASE tests are development, question design and approaches to answering the different type questions, test preparation methods, and test taking skills & tips. Techniques will be covered which will allow you to identify the areas you are weakest and focus your test preparation effort on those areas, minimizing the time required for study. ASE style questions will be used throughout to emphasis and reinforce the information being covered. And, with a knowledgeable instructor to guide you, your questions can be explained and answered in detail as they come up!

The following ASE test areas are covered...

<i>Engine Repair- A1</i>	<i>Electrical/Electronic Systems- A6 *</i>
<i>Automatic Transmission/Transaxle- A2</i>	<i>Heating and Air Conditioning- A7 **</i>
<i>Suspension and Steering- A4</i>	<i>Engine Performance- A8</i>
<i>Brakes- A5</i>	<i>Advanced Engine Performance- L1</i>

“... with a knowledgeable instructor to guide you, your questions can be explained and answered in detail as they come up!”

* The Electrical/Electronic Systems- A6 course will also help in preparation for Medium/Heavy Truck Electrical/Electronic Systems- T6, School Bus Electrical/Electronic Systems- S6, and Collision Repair test B5- Mechanical and Electrical components for Content area B- Electrical.

** The Heating and Air Conditioning- A7 course will also help in preparation for the Medium/Heavy Truck Air Conditioning- T7 and School Bus Air Conditioning- S7.

This class reviews electrical concepts—atomic structure, charges, magnetism, and Digital Multi-Meter use. Circuits are examined and analyzed. The student will participate in practical application of Ohm’s and Kirchoff’s laws. Students will discover many advanced uses for the digital meter. This is a hands-on class, each student will need to bring their own meter. Hands-on testing will be performed by the student on electrical circuit training aids, and on vehicles.

Animation is used to explain semiconductor operation.

This is a hands on class, bring your DVOM/DMM!

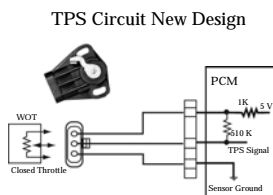
Topics covered:

Electricity & Electronics- Simple, series, parallel and series-parallel circuits.

“Real world” application of Ohm’s and Kirchoff’s laws, Induction and inductive reactance, DC Voltage signals, AC Sinusoidal and non-

sinusoidal signals, Conductors and insulators, Current flow- Conventional Vs. Electron theory. Semi-conductors- diode and

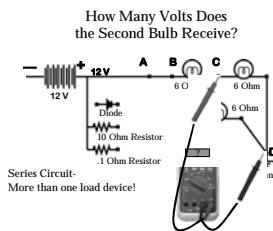
transistor construction, function, identification, application and out-of-circuit testing. NPN & PNP transistors, small signal, rectifier, clamping, and avalanche diodes are discussed.



Digital Meters- Meter construction and function, manual and auto ranging meter scaling and interpretation, High impedance digital meters- why they are needed, and does yours qualify? Circuit damage caused by using the wrong meter. Meter accuracy, measuring EMF, intensity of current, electrical resistance, static Vs. dynamic resistance, diode test function, true RMS vs. average responding meters, Zero-delta-relative modes, trigger, measuring frequency, pulse width, and duty cycle, meter maintenance.

Advanced meter features-How and when to use-Min-Max-average-Recording, Touch-hold function. Power up options-Disable auto off, High accuracy 1 ms response, Low ohms.

Classroom exercises- Voltage drop, amperage, and resistance testing- on electrical simulator boards. Semi-conductor testing, Voltage and frequency measurements- on sensor simulators.



Shop exercises- Testing O₂ sensors and other computer inputs and outputs devices. Quickly measure amperage draw of all on board computer controlled actuators (solenoids, relays etc.), Voltage drop testing.

The objectives stated for this course are:

Upon completion of this course the student...

will be able to use his DVOM to successfully diagnose circuit and component failures.

will be able to explain the practical application of Ohm’s and Kirchoff’s laws.

will be able to identify simple, series, parallel and series-parallel circuits and diagnose failures.

will be able to explain the difference between conventional and electron theories of current flow.

will be able to explain the difference between dynamic and static resistance as it applies to ohm’s law.

will have a basic understanding of semiconductor operation and will be able to properly identify diodes, NPN & PNP transistors and zener diode symbols as used in wiring schematics.

will be able to identify the value indicated on the DVOM based on displayed digits, decimal point location, scale selected and range indicator displayed.

Given a properly functioning DVOM the student will be able to measure voltage, amperage, and resistance in an electrical circuit.

will be able to explain and demonstrate voltage drop testing.

will be able to diagnose circuit or component failures using min-max-averaging and touch hold features of the DVOM

will be able to successfully measure frequency, pulse width modulated and duty cycle signals

will be able to make informed decisions on meter selection (true RMS vs. average responding) when confronted with non-sinusoidal AC signals



EAST TRAINING

DIGITAL STORAGE OSCILLOSCOPE - PART I

Course #112

8 Hours

This class is designed to instruct the student in the proper thought process to be used when setting up a digital storage oscilloscope- DSO.

Learn about the many different types of automotive signals. Instructions are provided on how to acquire the many common waveforms and how to interpret these waveforms.



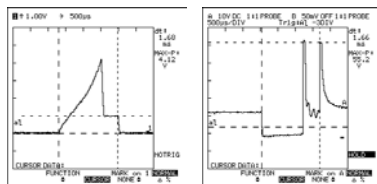
Relevant electrical and electronics concepts introduced in the DVOM course will be reviewed. This is a hands-on class. If you have a DSO bring it. If not, you will still have an opportunity to learn features and benefits of available units which will make you better informed to help you choose a DSO and become immediately productive. (Prerequisite course #111)

This is a hands on class, bring your DSO!

Topics covered:

Electricity & Electronics- Analog Vs digital scopes, Electrical cycles, Analog/digital signals, Frequency/Hertz, Pulse width, Duty Cycle, Analog & digital signals.

DSO- Voltage scale, Time-base, Ground position, Auto set, Trigger level, slope, and source, Auto trigger/freerun, Trigger delay, Single/continuous



sweep, 1-2-5 rule, A/C - D/C coupling, Record function, Cursor function, Proper Test connections, Interpreting waveforms.

Classroom exercises: Capturing and storing of analog & digital signals from sensor simulators.

In shop testing:- Sensor worksheets, Stress testing and capture of O₂ sensor waveforms, testing computer system input and output signals, Injector driver diagnosis.

The objectives stated for this course are:

Upon completion of this course the student...

while receiving signals of known frequency, speed, and amplitude the student will be able to properly set the DSO- volts per division, time-base, ground position, trigger level, trigger slope, and source to display a proper waveform.

will be able to correctly identify when to use AC coupling.

will be able to capture analog and digital signals from inputs (TPS, EVP, MAP) and outputs (fuel injectors).

will be able to properly stress test oxygen sensors, capture and store the waveforms and identify sensor failures.

DIGITAL STORAGE OSCILLOSCOPE - Part II

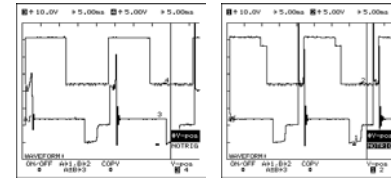
Course #115

8 Hours

This class reviews the thought process used to set up a DSO.

Relevant electrical and electronics

concepts introduced in the DVOM and DSO-I course will be reviewed. Learn about the many different types of automotive signals.



Instructions are provided on how to acquire and interpret strategic waveforms. Advanced methods demonstrated include use of AC coupling to look for compression and vacuum problems, and how to use and compare dual traces to their fullest advantage. Current ramping concepts will be covered. Bring your DSO. (Prerequisite course #112)

This is a hands on class, bring your DSO!

Topics covered

Electricity & Electronics- Analog/digital signals, Frequency/Hertz, Pulse width and Duty Cycle.

Advanced DSO- Creative testing techniques—Engine compression & volumetric efficiency testing, Computer input sensor dual trace testing, Road testing techniques, Cursor measurement functions. Creative Triggering techniques and special Functions. Thought Process to acquire and view a waveform, Down loading and printing waveforms. Storing & retrieving waveforms from memory, Building your own waveform library. Inductive and capacitive pick-ups, probe calibration, accessories, and adapters. Avoiding EMI (Electro-Magnetic Interference). Dual trace testing- Mixture Solenoid or injector over oxygen Sensor, Measuring Secondary Ignition waveforms. Injector Misfire Diagnostics— Saturated drivers, Peak and Hold drivers, Injector On-Time. Amperage Waveforms- Fuel Pump RPM and Amp Testing

Classroom exercises- Signal capturing, interpreting, storing, and retrieving using sensor simulators.

In shop exercises- Capturing, interpreting, storing and retrieving several waveforms using single and dual trace capabilities.

The objectives stated for this course are:

Upon completion of this course the student...

while receiving signals of known frequency, speed, and amplitude the student will be able to properly set the DSO- volts per division, time-base, ground position, trigger level, trigger slope, channels, and source to display dual channel waveforms.

will be able to use cursors to properly measure signal parameters.

will be able to capture, store, and retrieve waveforms.

EAST TRAINING

AIR/FUEL DRIVEABILITY & EMISSION DIAGNOSTICS Course #113 8 Hours

Learn about the Chemistry of combustion. Learn what each of the exhaust gases- CO, CO₂, O₂, HC, NOx indicate. Learn how to use exhaust readings to diagnose engine performance and driveability concerns, as well as, emission problems. Learn what happens in the combustion chamber and in the catalytic converter. See how other gases such as ammonia affect emissions. Learn how to interpret exhaust readings before and after the catalytic converter.

Bring your DSO or a DVOM!

Topics covered:

Gas Analyzers- BAR 74, 80, 84, 90, 97, Calibration and maintenance tips. Emission testing- I&M tests explained- FTP, Static and loaded mode tests, transient and steady state, basic idle, two speed idle, IG-240, IM-240, BAR 31, IN 93, ASM 5015, 2525. Sampling methods- Partial stream, CVS, VMAS (percentages Vs Grams per mile), DCF, Standards- Phase in Vs final.

Chemistry of Combustion- Types of matter, Mass Energy/Radiant Energy, Atoms, molecules, molecular structure, Reading chemical formulae, Perfect combustion Vs real world, Stoichiometry. Exhaust gas relationships- CO, CO₂, O₂, HC, NOx. Practical uses for an exhaust analyzer: Engine condition analysis, Mechanical / Ignition engine failures, Cylinder balance tests (HC per cyl.), Gasoline & Exhaust leaks, Catalytic converter testing, O₂ sensor testing, I&M testing and diagnosis.

In-Shop exercises -

Recognizing open / closed loop, identifying lean conditions, diagnosing inoperative fuel injectors & ignition misfires, interpreting gas readings before and after the catalytic converter using worksheets. Engine faults will be induced and the results analyzed.

The objectives stated for this course are:

Upon completion of this course the student...

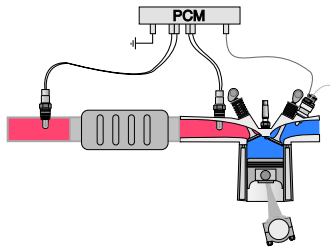
will be able to properly explain the relationship between CO, HC, CO₂, O₂ and NOx formation during combustion.

will be able to explain the major differences between basic and enhanced I/M tests (steady state / transient, static / loaded mode).

while using an exhaust analyzer the student...

will be able to diagnose- inoperative fuel injectors, ignition misfires, and lean misfires.

will be able to identify abnormal gas readings before and after the catalytic converter.



DRIVEABILITY & I/M FAILURE REPAIR STRATEGIES Course #118 8 Hours

This course takes a common sense, focused approach to diagnosing driveability, performance and enhanced emission failures. Learn the diagnostic strategy to use for driveability concerns, or when the vehicle's emission levels exceed the I/M test limits. Learn to diagnose NOx, carbon monoxide and hydrocarbon failures to cure driveability concerns. Learn baseline and verification techniques. Discover how to construct a road test procedure using an "in flight" gas analyzer. (Prerequisite courses #111, 112, 113 and 114)

Topics covered

Repairing an enhanced I/M or driveability problem- Increasing engine efficiency to Decrease exhaust gas emissions, Cause and Effect- The key to successful diagnostics in all systems, Developing a diagnostic strategy. Where to start a successful diagnostic path, Understanding emission testing- FTP, ASM, or IM/240, Steady State or Transient testing, DCF - Dilution Correction Factor.

Laws, Rules, and Regulations- Federal, State, Local, OSHA, Consumer Affairs. Waivers, Dollar amounts, What repairs *can* and *can not* apply towards waiver.

Classroom exercises- Customer Driveability Worksheet, I/M failure worksheet.

In shop exercises- 4 & 5 gas testing, O₂ sensor testing, baselining emission failures.

The objectives stated for this course are:

Upon completion of this course the student...

will be able to understand and explain the major differences between basic and enhanced I/M tests (steady state / transient, static / loaded mode).

will be able to properly explain the relationship between CO, HC, CO₂, O₂ and NOx formation during combustion.

will be able to follow a successful diagnostic path when diagnosing an emission failure.

will be able to explain and perform I/M failure baselining and repair verification techniques

while using an exhaust analyzer the student will be able to diagnose- inoperative fuel injectors, ignition misfires, and lean misfires, and identify abnormal gas readings before and after the catalytic converter.

EAST's mission is to provide convenient, accurate, timely, and enjoyable, leader-led training for professional in-service technicians. Training that is performance-based and measurable by an increase in the technicians' knowledge, productivity, profitability, and quality of repair services offered.

EAST TRAINING

02 SENSOR TECHNOLOGY & CATA CONV OPER & TESTING Course #114

8 Hours

Learn to pinpoint driveability and emission problems by looking at the O₂ sensor's output. Learn how to detect exhaust gas levels by looking at the O₂ sensor's waveforms. Compare the O₂ signal to the computer's fuel command to narrow down your search for the problem. Learn about the different types of catalytic converters including: pre-cats, two way, three way, dual bed and dual bed with supplemental air. How to test catalytic converters using many different methods and tools. Learn how to comply with government regulations when replacing catalytic converters. Bring your DVOM or DSO. (Prerequisite course #111 & 112)

Topics covered:

Oxygen Sensors- Types of sensors- Zirconia, Titania. One, two, three, four, and seven wire sensors. Sensor locations- OBD-I & II. O₂ sensor construction, function, and operation and testing. Tools and equipment required, how to connect, what to look for, interpreting results, causes of failures. Interpreting O₂ waveforms, and when to replace a sensor. Using the O₂ sensor to isolate defective systems, diagnose mechanical problems, verify repairs, and providing a diagnostic baseline. How to sell the repair. Catalytic Converters- Purpose, Design, Construction. Testing catalytic converters- Temperature, Rattle test, Back pressure, O₂ Snap test, CO₂ HC Test, Gas test before/after cat.

Failures and their causes- replacing catalytic converters, Government regulations.

In shop exercises- O₂ sensor testing, Before and after cat gas analysis.

The objectives stated for this course are:

Upon completion of this course the student...

will be able to properly perform and demonstrate the CO₂ / HC and catalytic converter test procedure.

will be able to properly connect test equipment and stress test O₂ sensors while measuring minimum and maximum voltage levels and testing for proper response time.

Bring your DSO or a DVOM!

ON BOARD DIAGNOSTICS-II (OBD-II) Course #116

8 Hours

Learn OBD-II regulations and the J-1930 terminology. Learn the advancements in OBD-II. See how advanced computer monitoring can detect EGR, catalytic converter and emission faults. See how the PCM can detect misfires. Learn to perform an OBD drive cycle. See what a readiness code is and how to set it.

Topics covered:

On Board Diagnostics- CARB standardization, OBD-I- Major requirements, Monitored Systems, Critical Input Signals, Problems and Limitations.

OBD-II- Regulations, Standards- SAE "J" standards included in the CAA of 1990- Common Terms, DTC's, DLC locations. Trouble Code identification, DLC 16 terminal pin commonality, OEM pin assignment, Serial data standards—UART and Class II, OBD-II Scan tool requirements, Diagnostic Test Modes, Diagnostic strategies, Component Monitoring Terms-Warm up cycle, Enable Criteria, Trip, Drive Cycle (FTP Drive Cycle).

Testing- Active, Passive, intrusive. Comprehensive component

ON BOARD DIAGNOSTICS-II (OBD-II) (Cont.)

Course #116

8 Hours

monitoring- Non-Continuous and Continuous testing
PCM diagnostics- Diagnostic Trouble Codes- Types- A, B, C, D- Setting, retrieving, clearing, Enabling criteria. MIL operation, Freeze Frame Data, Scan Tool Capabilities, Readiness status.

In shop exercises- Scan tool diagnostics.

Bring your Scan tool!

The objectives stated for this course are:

Upon completion of this course the student...

will be able to explain the major differences between OBD-I and OBD-II requirements.

will be able to explain OBD-I regulations and standards.

will be able to connect and properly set a scan tool to read system sensor parameters, diagnostic trouble codes (DTC's), freeze frame data, and monitor readiness status.

FORD ELECTRONIC CONTROL DIAGNOSTICS

Course #123

8 Hours

Understanding the Ford EEC system diagnostics— see how the EEC system evolved and where it is going. This course picks up where the OBD-II course left off. This is a hands-on class, Bring your scan tool. (Prerequisite course #116)

Topics Covered

System Evolution- EEC-I, II, III, MCU. Diagnostic Capabilities, DLC connectors, Diagnostic tools and Equipment, Definition of system tests, Self tests, KOEO, KOER. Continuous monitoring, FMEM, Adaptive strategies, Re-learn Procedures, Code terminology- Slow codes, Fast codes, Fault codes. Diagnostic test flow, Scan data.

Serial and Non-Serial Data Vehicles, Serial Data OBD-II Vehicles, Understanding Scan-Tool Test Modes & Terminology, and Generic Scan-Tool Diagnostic Modes. Learn how to increase the scan-tool's display rates, select the proper parameters and how to customize your set-up. Review of live scanner data and study of Ford specific diagnostic modes. **Bring your Scan tool!**

EEC-IV& V- Scan Data Scope Patterns, Multiplexing, Communication Network, Optimizing your scan tool capabilities, Code parameters. Diagnostic Monitors- Ignition diagnostic monitor, Catalyst Efficiency Monitor, Enhanced EVAP system Monitors, EVAP bypass logic, Continuous memory codes, KOEO codes, KOER codes, EEC-V codes.

Classroom exercises- DPFE data point worksheet

In shop exercises- Scan tool diagnostics

The objectives stated for this course are:

Upon completion of this course the student...

will be able to explain the evolution of the Ford electronic engine control systems.

will be able to properly identify the MCU and EEC I through V systems.

EAST TRAINING

FORD ELECTRONIC CONTROL DIAGN (CONT.)

Course #123

8 Hours

will know the on board diagnostic capabilities of each system. will be able to explain the procedure to initiate the self test, computer timing check, output actuator cycling, cylinder balance and IVSC tests.

will be able to explain the differences between continuous and on demand codes retrieved during KOEO and KOER tests.

will be able to explain FMEM, adaptive strategy and relearn procedures.

will be able to customize serial data parameters for optimum diagnostic capabilities.

CHRYSLER ENGINE CONTROL DIAGNOSTICS

Course #124

8 Hours

Examine Chrysler On Board diagnostics past, present and future. Understand Scan-Tool test modes and terminology, Chrysler specific diagnostic modes and using Scan-Tool bi-directional capabilities. You will review live scanner data.

Bring your Scan tool!

Topics covered- O₂ Feedback Vehicles, EFI & Turbo Vehicles, Serial Data OBD-I Vehicles, CCD Vehicles, Serial Data OBD-II Vehicles. Evolution of computer modules, evolution of diagnostic connectors, connector pin assignments, scan tool tests- scan data, ATM tests, transmission data, customizing your scan tool data. CCD and PCI systems will be covered, and a review of known system problems.

The objectives stated for this course are:

Upon completion of this course the student...

will be able to properly explain the evolution of the Chrysler engine control systems.

will be able to perform scan data, ATM switch tests and transmission data tests.

will understand and be able to explain the operation of the CCD and PCI systems..

will be able to customize scan tool serial data parameters for optimum diagnostic capabilities.

AUTOMOTIVE ELECTRICITY

Course #119

8 Hours

This is a hands-on class, each student is asked to bring their own DVOM/DMM. This class reviews electrical concepts—atomic structure, charges, magnetism, and Digital Volt Ohmmeter use. The students will participate in practical application of Ohm's Law during hands-on sessions using table mounted electrical circuit training aids, and on vehicles. We will review starting and charging system theory, operation, and diagnosis and will cover common, and not so common, starting and charging system failures. Learn about battery construction, testing, and checking for high resistance connections. Also covered is diagnosis of electrical failures using wiring diagrams.

AUTOMOTIVE ELECTRICITY (Cont.)

Course #119

8 Hours

This is an excellent preparation for technicians taking any of the ASE electricity/electronics tests (Automotive, Medium /Heavy-duty truck, or School bus). (*Prerequisite course #111 & 112*)

This is a hands on class, bring your DVOM/DMM!

Topics Covered-

Electricity & Electronics- Metric Units of Measurement, Electrical principles—atomic structure, charges, magnetism. Practical application of Ohm's and Kirchhoff's laws, Induction and inductive reactance, AC & DC Voltage signals, Induction and inductive reactance, simple, series, parallel and series-Parallel circuits.

System testing- Starter System & Component Testing, voltage drop testing, battery construction, and testing - State of Charge Test, Open circuit voltage test methods, Load and capacitance Testing, Parasitic draw testing. Charging System Operation & Testing, Rectification.

Electrical failures- Charging circuit, Cooling fan circuit, Asian PFI & TBI circuits, Airbag circuit, PCM circuit

Classroom exercises- Voltage drop, amperage, and resistance testing- on electrical simulator boards. Voltage and frequency measurements- on sensor simulators. Demonstration of half wave and full wave rectification on a simulator board.

In shop exercises- Voltage drop testing of battery, starter, and alternator circuits; OCV testing, component amperage draw testing. Testing for alternator AC ripple and coolant electrolysis.

The objectives stated for this course are:

Upon completion of this course the student...

Given a properly functioning DVOM the student will be able to measure voltage, amperage, and resistance in starting, charging and lighting circuits.

will be able to explain and demonstrate voltage drop testing in starting, charging and lighting circuits.

will be able to perform battery OCV and load tests, charging system output, starter draw tests and interpret the results.

will be able to properly test for excessive alternator AC ripple and coolant electrolysis.

will be able to perform parasitic draw testing.

ENGINE PERFORMANCE ANTHOLOGY

Course #122

8 Hours

This comprehensive course covers many aspects of engine performance. It will enhance your electrical, engine performance, and emission failure diagnostic skills, and is an excellent preparatory class for ASE A-8 (Engine Performance) and L-1 ASE Advanced Engine Performance tests. (*Prerequisite courses #111, 112, 113 and 114*)

Topics Covered - Combustion principles, Compression Theory, Thermodynamics, Volumetric efficiency and methods used to increase VE, Vacuum testing, Cranking & running compression testing, Air/Fuel Theory, 4 – 5 Gas Analysis. Ignition System primary and secondary patterns diagnosis, Scan Tool Diagnostics, External Emission System Controls. Electrical Diagnosis— Reading and evaluating wiring diagrams. Understanding OBD-II Theory and Operation.

In shop exercises- Cranking and running compression tests, Vacuum tests, Ignition scope primary and secondary ignition tests, exhaust gas analysis.

EAST TRAINING

ENGINE PERFORMANCE ANTHOLOGY (Cont.)

The objectives stated for this course are:
Upon completion of this course the student...
will be able to properly perform cranking compression tests, and interpret the results.
will be able to properly perform running compression tests, and interpret the results.
will be able to explain the differences between cranking and running compression.
will be able to perform cranking and running vacuum tests and properly interpret the results.
will know how to interpret primary and secondary ignition patterns.

GM ABS SYSTEMS- Theory, Oper. and Diagnosis Course #125 8 hours

This course will start with a quick review of electricity and hydraulics and then move on to the how's and why's of ABS brake systems and their operation. The course includes detailed examination of how the systems work, what goes wrong, and proper diagnostic procedures.

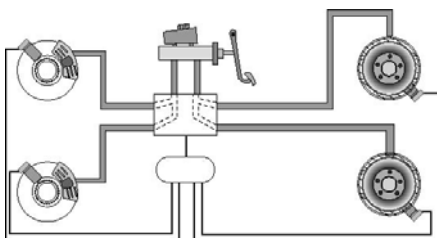
Topics Covered-

GM RWAL- Component operation, use of DLC, fault codes, warning lamp operation, VSS DRAC operation, Scan tool use.
Delco VI- Component operation, fault codes, warning lamp operation, re-homing the motor pack, bleeding procedures, Scan tool use, master cylinder and motor pack disassembly and repair.

The objectives stated for this course are:
Upon completion of this course the student...
will be able to properly explain the theory of ABS- Anti lock braking systems.
will be able to diagnose faults in the Delco VI and RWAL warning light circuits.
will be able to follow diagnostic procedures to repair system faults.
will be able to disassemble and reassemble motor pack units.
Given a properly equipped scan tool will be able to retrieve system fault codes and perform motor pack re-homing procedures.

Students will disassemble, inspect, and reassemble Delco VI units under the guidance of the instructor.

Four Channel System

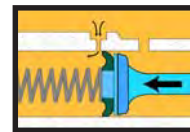


BRAKE SYSTEM THEORY AND OPERATION Course #121

8 Hours

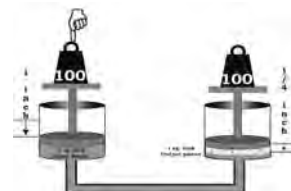
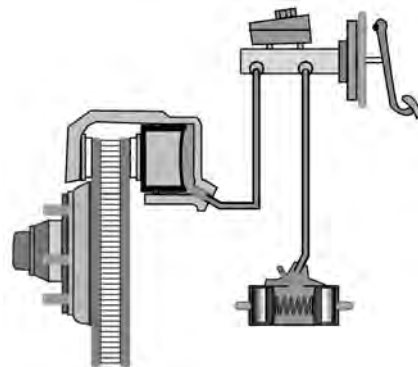
Excellent for a new man in the shop, as preparation for the ASE Brake test, or as a review for experienced technicians.

- Learn about the laws of fluids and physics.
- Learn how to diagnose and solve braking problems.
- Learn how to prevent comebacks.
- Learn how to use measuring tools and perform proper bleeding procedures.



The objectives stated for this course are:
Upon completion of this course the student...
will understand the operation of brake hydraulic control components- Master Cylinder, metering valves, proportioning valves, residual check valves, pressure control valves.
will be able to properly diagnose causes of brake pulling.
will understand proper bleeding methods.
will be able to properly diagnose causes of brake drum and rotor failures.
will be able to explain and demonstrate measuring and machining of drums and rotors.

Target Audience- New and experienced technicians. For ASE Brake test preparation and/or review of brake system operation for recertification.



EAST TRAINING

WHEEL ALIGNMENT Course #120

8 Hours

This course has been developed for the technician that wants to truly understand suspension, steering and wheel alignment theory and operation. Learn road-testing techniques to help diagnose pulling, drifting, bearing and tire noises. Learn how to put the vehicle back to specifications when other repair centers can't.

The objectives stated for this course are:

Upon completion of this course the student...

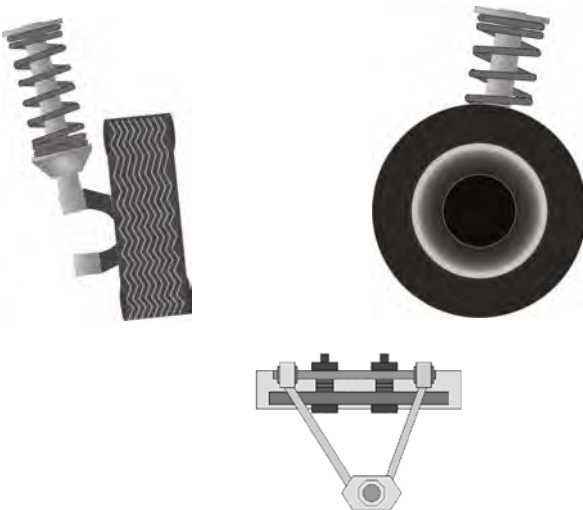
will be able to identify the different designs of suspension and steering systems.

will understand how to view the vehicle specifications and make adjustments accordingly.

will be able to set caster, camber, toe in, and toe out adjustments

will be able to identify front-end problems causing tire wear conditions.

Target Audience- for the new or experienced technician or those preparing for the ASE Suspension & Steering test. A great refresher for the experienced technician who wants a review of the basics and also wants to pick up a few tips.



ADVANCED ENGINE PERFORMANCE & ASE L-1 TEST PREPARATION Course #117

8 Hours

This test preparation course is a must for anyone about to take the L-1 exam. You will cover Power-train diagnostics including compression readings, 5-gas theory and the I/M failure diagnostics utilizing Constant Volume Sampling, Pressure Purge testing, I/M 240 and ASM testing. Also covered will be Emission Control Systems with a composite vehicle systems overview. Test taking skills and tips will be offered.

Target Audience- Experienced Technicians preparing for the ASE L-1 test, or technicians looking for a review of the latest engine performance and OBD-II diagnosis techniques.

IGNITION SYSTEM OPERATION & DIAGNOSIS Course #127

8 Hours

Like all other systems in the modern automobile, the ignition system has continued to evolve at an alarming pace. Understanding the theory, operation, and testing of the new systems is critical to customer friendly diagnosis and repair.

Topics covered:

- After a quick review of magnetic fields, self/mutual induction, and ignition system operation- we will cover the Domestic systems in detail- primary circuit triggering- (Hall effect, magnetic, and optical).
- GM, Ford, and Chrysler spark distribution systems- DI, EI, Coil Over Plug, and Coil Near Plug will be explained.
- Methods of triggering the modules and coils on each system (on-car and on-bench) to speed up diagnosis will be described.

The objectives stated for this course are:

Upon completion of this course the student...

will be able to explain magnetic fields and induction as related to ignition operation.

will be able to explain transistor operation and use in ignition circuits.

will understand Circuit Switching (points & transistor)

will understand the theory and methods used for triggering- Hall Effect, magnetic, & Optical

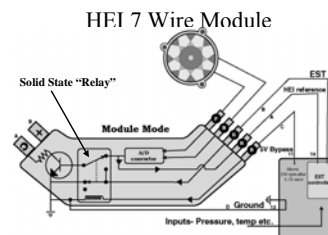
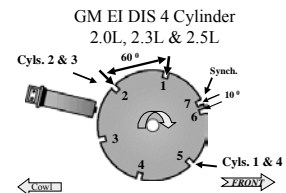
will be able to identify the various types of spark distribution systems used today- DI, EI, Coil Over Plug, and Coil Near Plug.

Classroom exercises-

An **ignition simulator** is used to demonstration methods for triggering several types of ignition systems. Demonstration of tools available for purchase (and to fabricate) for triggering common, and not so common, systems.

In shop exercises-

Demonstrations of triggering several ignition systems on vehicles.



EAST TRAINING

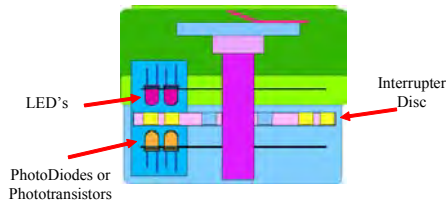
ASIAN IGNITION SYSTEM OPERATION & DIAGNOSIS COURSE #127A

8 HOURS

Like other systems in the modern automobile, the ignition system has continued to evolve at an alarming pace. The Asian systems can be even more daunting due to the mystique associated with them, usually compounded by the lack of understandable repair information. Knowing the theory, operation, and testing of the systems is critical to quick and profitable diagnosis and repair.

Topics covered:

- After a quick review of magnetic fields, self/mutual induction, and ignition system operation- we will cover the Asian systems in detail- primary circuit switching and triggering methods- (Hall effect, magnetic reluctance and optical sensors).
- Spark distribution systems- DI, EI, Coil Over Plug, and Coil Near Plug will be covered. New spark plug technologies will be explained. Ignition timing will be discussed, as well as, combustion anomalies.
- Methods of triggering the modules and coils on several representative systems using an ignition simulator, or on-car, to speed up diagnosis will be described. Toyota, Honda, Nissan, Hyundai/Mitsubishi, Mazda, and Subaru are among the systems which will be described. As a bonus we will discuss several newly emerging technologies, such as Hybrid, Fuel Cell, and electric vehicles, which the Asian manufacturers are already selling overseas and in the USA.



The objectives stated for this course are:

Upon completion of this course the student...

will be able to explain magnetic fields and induction as related to ignition operation.

will be able to explain transistor operation and use in ignition circuits.

will understand Circuit Switching (points & transistor)

will be able to explain photoelectric device operation and use in ignition circuits.

will understand the theory and methods used for triggering- Hall Effect, magnetic reluctance, & Optical

will be able to identify the various types of spark distribution systems used today- DI, EI, Coil Over Plug, and Coil Near Plug.

Classroom exercises-

An ignition simulator is used to demonstrate methods for triggering several types of ignition systems. Demonstration of tools already in your box, or available for purchase (or to fabricate) for triggering ignition systems will be shown.

In shop exercises-

(Location and Time permitting) Demonstrations of triggering several ignition systems on vehicles.

AUTOMATIC TRANSMISSION/TRANSAXLE- OPERATION AND DIAGNOSIS COURSE # 130

8 HOURS

Whether you're trying to improve your automatic transmission diagnostic skills, learn how to identify transmission-related performance problems, or just want to earn ASE gold, this is the course for you.

To properly diagnose transmission-shifting failures, and transmission related engine performance problems on new vehicles with computer controlled shifting, you must understand what makes a transmission "tick". This course is a prerequisite for our #130E course covering electronic computer controlled transmissions, which will be introduced during 2003.

Topics covered include: Fundamentals of operation- Fulcrums, levers, and creating mechanical advantages; Converter operation- stators & TCC; Performing/evaluating oil pressure tests; Fluid coupling, Friction, and planetary unit operation; Road testing and evaluating drivers concerns; Scan tool diagnostics; Computer Controlled Transmission Functions- TCC application, gear changes, and mainline pressure control. This course is excellent preparation for the ASE A-2 test. It has been our experience that this test is the one most responsible for technicians failing to attain ASE Master Technician status. A **pneumatically operated, cutaway automatic transmission** will be used to demonstrate transmission operation. **Animation** is used to explain key operating points.



The objectives stated for this course are:

Upon completion of this course the student...

will be able to properly explain the operation and purpose of holding units (clutches, bands).

will be able to properly explain the operation and purpose of planetary gear units.

will be able to perform oil pressure diagnostic tests and evaluate results.

will understand and be able to explain hydraulic valve operation (shift valves, pressure valves etc.).

will be able to explain TCC clutch operation and perform diagnostics on TCC systems.

Target Audience- Experienced technicians with a background in automatic transmission theory/diagnosis and repair.

ELECTRONIC AUTOMATIC TRANSMISSION/ TRANSAXLE- OPERATION AND DIAGNOSIS COURSE # 130E

8 HOURS

Builds on Automatic Transmission Course #130. Reviews transmission mechanical and electronic theory and operation then covers electronic pressure and shift control. This course is excellent preparation for the ASE A-2 test. The L1- Advanced Engine Performance test also covers several questions regarding to the electronic shift computer controlled transmission. **This course, and course #130, are a must for Engine Performance Diagnosticians.**

EAST TRAINING

ELECTRONICS IN THE MODERN AUTOMOBILE-

COURSE #131

8 HOURS

This is a hands on class, bring your DVOM/DMM!

Application of semiconductors and other electronic components in the automobile— Construction, function, identifying ratings, and testing of the following components are covered: Diodes— for rectification, circuit protection, current control, Zener diodes (for voltage regulation), Relays and solenoid circuits, Bipolar Transistors— NPN & PNP used for switching and amplification, SCR's— (Silicon Controlled Rectifiers) Resistors— Carbon composite, Metal film, Wire wound, Variable Resistors (Rheostats, Potentiometers, Thermistors), Capacitors— Ceramic, Mica, Electrolytic, R/C circuits, Coils & transformers, Photoelectric devices— photodiodes, phototransistors, LED's. Integrated circuits will also be introduced (with emphasis this class on the 555 timer chip). **Animation** is used to explain P & N material and diode function.

•ESD— what it is and how to guard against damage of solid-state devices during diagnosis and service

•Tools used for electronic diagnosis— DSO's, Analog Scopes, DVOM/DMM's, Logic Probes, Logic Pulsers, LED testlights, and discrete component testers will also be discussed. Bring your DVOM!

Classroom exercises—The student will build circuits using tabletop electronic trainers. Diodes, Zener Diodes, LED's, Relays, and Transistor Circuits will be built and analyzed.

Several types of automotive electronic circuits will be evaluated, analyzed, and explained. Schematics will be presented describing construction of several useful shop diagnostic tools, which can be assembled using knowledge learned in this course.

Due to the amount of time spent building circuits on the electronic trainers in the classroom, there will be no shop time.

Objectives stated for this course are:

Upon completion of this course the student...

will have an understanding of proper tools and equipment used in solid-state electronics diagnosis.

will be able to demonstrate proper service procedures to avoid ESD damage to solid-state components.

will have an understanding of semiconductor component operation and use in electronic circuits and modules.

will be able to explain the practical application of Ohm's and Kirchhoff's laws in electronic circuits.

will be able to properly identify diodes, Bipolar NPN & PNP transistors, zener diodes, Capacitors, and coils symbols as used in wiring schematics.

AUTOMOTIVE A/C SYSTEM THEORY, DIAGNOSIS, SERVICE AND RETROFIT PROCEDURES

COURSE #132

8 HOURS

Covers both R 12 and R134a refrigerants used in auto A/C applications. Designed to enhance technician skill levels with the latest methods and service techniques along with the correct procedures and problems associated with retrofitting an automotive R12 system to R134a. Compressor, evaporator, condenser designs, air distribution and control methods, and blower speed control systems will be covered.

AUTOMOTIVE A/C SYSTEM THEORY, DIAGNOSIS, SERVICE AND RETROFIT PROCEDURES (CONT.)

Animation will be used to demonstrate key operating points. This class will help you to avoid many common pitfalls when retrofitting and servicing today's A/C systems and will also alert you to the potential problems of cross-contamination of refrigerant and air in an A/C system.

Target Audience- Experienced technicians with some background in Air Conditioning diagnosis and service.

The objectives stated for this course are:

Upon completion of this course the student...

will be able to properly explain A/C refrigerant system (Orifice tube & Expansion valve) operation.

will be able to explain system component operation and function.

will be able to properly perform an A/C system leak check.

will be able to properly perform an A/C system performance test and interpret the results.

will be able to diagnose A/C system faults using pressure and temperature readings.

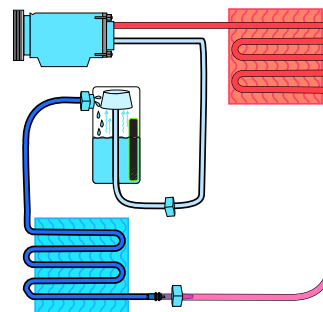
will be able to properly explain the need for refrigerant recovery.

will be able to properly explain the danger of improper refrigerant use.

will be able to determine proper retrofit procedures and equipment requirements.

will be able to determine proper retrofit component needs.

will be able to properly avoid system contamination.



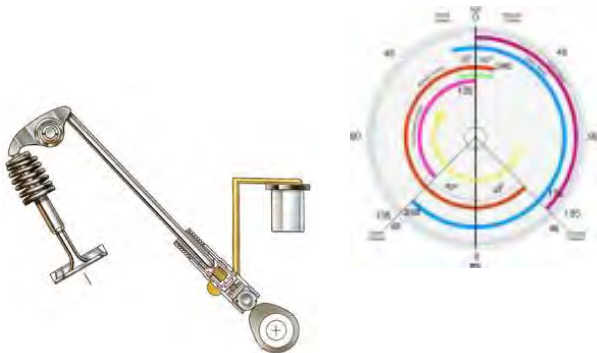
EAST TRAINING

ADVANCEMENTS IN ENGINE DESIGN COURSE #137

8 HOURS

We will cover engine operational principles- Compression & Combustion principles, Thermodynamics, Valve and ignition timing, Volumetric efficiency and methods used to increase and control VE- Supercharging & turbo charging, Multi-valves engines, Variable displacement intake manifolds etc. Several new or misunderstood testing techniques will be covered. Case studies and pattern failures will be covered. Improvements to gasoline and diesel engine design, which have, or are being introduced, such as Variable valve timing & Gasoline direct injection.

Bonus- Preliminary Fuel cell and hybrid vehicle information.

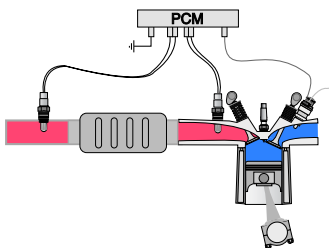


FORD OBD-II COURSE #136

8 HOURS

Learn what advancements Ford has designed into their OBD-II diagnostics and how they addressed the OBD-II regulations. See how Ford's advanced computer monitoring can detect EGR, catalytic converter, idle air control and emission faults. Testing- Active, Passive, intrusive. Comprehensive component monitoring- Non-Continuous and Continuous testing. Critical Input Signals, Problems and Limitations. Scan tool requirements, Diagnostic Test Modes, Diagnostic strategies, Component See how the Ford system detects misfires. PCM diagnostics- Diagnostic Trouble Codes- Types- A, B, C, D- Setting, retrieving, clearing, Enabling criteria. MIL operation, Freeze Frame Data, Scan Tool Capabilities, Readiness status. Bring your scan tool.

Bring your Scan tool!



EVAPORATIVE EMISSIONS SYSTEMS (OBD-II), THEORY, OPERATION AND DIAGNOSIS COURSE #135

8 HOURS

The evaporative system accounts for the most frequent number of emission failures found in states with enhanced I&M programs. It is also the most misunderstood and troublesome for technicians to profitably repair. Enhanced and Non-enhanced evaporative systems will be included on Asian, European, and domestic vehicles. Includes comprehensive coverage of operational theory, system components, & component monitoring. Also, covers *Natureal Vacuum Lead Detection Systems*.

A few of the topics covered are:

Automobile VOC Sources
Crankcase HC Emissions
Tailpipe HC Emissions
Evaporative HC Emissions

Allowable Evaporative Losses

FTP- Grams per mile

Vapor Canister System Operation

Formation of Ozone & Tropospheric Ozone

Oxidants

Photo-disassociation of NO₂

OBD-II Component Monitoring

Enabling Criteria

EVAP System Monitoring Components

HEGO, Fuel trim, Evap fuel level, fuel tank pressure sensors

Pressure & Vacuum measurements, Chrysler Leak detection pumps, and much more!



NVLD Valve



ELECTRONICS IN THE MODERN AUTOMOBILE- MODULE B

COURSE #131B

8 HOURS

This course builds on Electronics module 1. We will cover additional electronic components and systems used in the automobiles of today and tomorrow. We will delve deeper into the use of semiconductors- Darlingtons pairs; open collector transistors, op-amps and other components will be covered. We will discuss diode and transistor gate logic circuits, and will begin covering DIN wiring schematics. Recently introduced sensors will be covered. We will be constructing more complex circuits on our electronic trainer boards. As in module 1, several types of automotive electronic circuits will be evaluated and explained. Schematics will be presented describing construction of useful shop diagnostic tools, which can be assembled using knowledge learned in this course. Students are asked to bring their DVOM/ DMM.

This is a hands on class, bring your DVOM/DMM!

EAST TRAINING

GENISYS SCAN TOOL FUNCTION, OPERATION, AND DIAGNOSTIC PROCEDURES

COURSE# 150

8 HOURS

You have a significant investment in a state of the art diagnostic tool. Wouldn't you like to get a return on that investment? Have you received any training on the equipment that will allow a proper return? Do you know all you need to know about the Genisys to ensure you are getting all you should out of the tool?

This is a hands on class, bring your Genisys!



Genisys is a registered trademark of SPX OTC Inc.

Some of the topics covered will be...

- External Ports and their Functions- Smart Card & PC Card Slot.
- Cartridge Reader Module.
- Command Buttons- Function, Direction, & Action Keys
- Using the Application Manager- Setting unit defaults, Adjusting screen contrast, Determining available memory.
- Updating using a modem card or a PC
- Interface cables - DB-25 Extension, OBD-I & II
- Scan Data/ Scope Patterns.
- Selecting and Sorting PID's- Viewing in Graphic & Analog View.
- Capturing Data - Record Mode, Freeze Frame and record, Code Trigger.
- Playback, Saving Data, Making a recording.
- Function Key 4- Print, Zoom, Sort, etc. · Pathfinder Mode - Using Pathfinder Software, Repair Trac, Symptoms, Data/ Sensor, TSB references, Drive cycle & BOB information, Component Location.
- Programming - Entering Information, "Reusing setups", Demo mode.
- Other Programs in Scan Diagnostics- OBD II Diagnostic Tests, Cartridge reader, ABS/Air Bag, GM SPS Reprogramming, Monitor 4000 Emulation.
- Controller Area Network (CAN) Compatibility.
- Case Studies will be covered highlighting diagnostic techniques using the Genisys.
- Generic - Global OBD II Functions... and much, much more!

GM OBD-II OPERATION & SCAN TOOL DIAGNOSIS

COURSE# 180

8 HOURS

Understand GM system diagnostics. See how the GM OBD-I and OBD-II systems evolved and what we can expect in the future. This course picks up where our generic OBD-II course left off.

This is a hands on class, bring your Scan tool!!

We will cover...

System Diagnostic Capabilities	Adaptive strategies
Scan tool capabilities	Code terminology
DLC connectors	Fault code history
Diagnostic Tools and Equip.	Pending codes
Misfire counter	Diagnosing circuit and
Relearn procedures	component faults using scan data

Learn how to properly configure your scan tool for greater productivity. Will also include using Failure Records, data stream interpretation, making use of bi-directional capabilities, accessing information on individual computers- ECM, PCM, TCM, and Body Control Modules, and much more.

Bring your Scan tool!



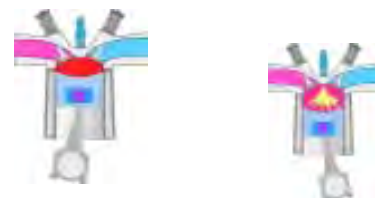
DIESEL THEORY & OPERATION

COURSE# 160 (Coming Soon)

1 DAY

Begins by explaining the reasons behind the recent resurgence of diesel engine technology.

This course covers diesel fundamentals, CI engine components, gasoline Vs diesel compression /combustion dynamics, combustion chamber & piston design differences, fuel supply & delivery systems, mechanical & electronic injection systems, glow plug control systems, cylinder balance/compression testing, smoke and noise diagnosis, scan tool diagnostics- accessing available information with your scan tool, understanding the diesel PID's, utilizing bi-directional capabilities, maintenance and service issues, and much, much more!



EAST TRAINING

ELECTRICITY, ELECTRONICS AND METER DIAGNOSTICS

COURSE# 211

8 HOURS

This is an even more advanced version of our DVOM Diagnostics and Auto Electric courses. More electrical theory and electronics are introduced, as well as, use of the inductive amperage probe for electrical/engine performance diagnostics. Additional DVOM information (Uses, maintenance etc.) and information on the CAT-III meters required for Hybrid/High Voltage vehicle service is included.

This is a hands-on class! Bring a DVOM/DMM and Inductive Amperage Probe. Considerable live circuit testing will be conducted using circuit simulators and components tests will be performed.

Prerequisites: #111, #119 or #BF511

- DVOM-DMM Functions Review
- Proper Scaling/ ranging of a meter
- Reading and comprehending the meters values/scales

Students will perform hands-on exercises using DMM's to select proper meter functions, probe leads, and port locations.



Several Case Studies of Diagnosis' using the Low Current Probe will be explained and advanced uses of the probe will be covered.

Electricity Review

- Volts / Amps / Ohms: The definition of all three components that create electromotive force.
- Structure of the Atom.
- Theory- correcting misguided assumptions and myths.
- Practical application of Ohm's Law and its importance to successful electrical diagnosis.

Practical Applications of Amperage Testing

- Understanding current flow in a live circuit
- Using amperage measurements to diagnose electrical failures.
- Parasitic draw testing
- Inductive current probes (Low and High amp)
- Probe Operation
- Connecting to your Meter or DSO.
- Setting up and Zeroing the probe.
- Diagnostic Techniques
- Calculating and confirming PCM Controlled Component current values (Solenoids, relays, motors, etc.)



Electrical Circuits Review

- Voltage Dividing Circuits
- Parallel Circuits
- Series-Parallel Circuits
- Static vs. Dynamic Testing
- Circuits will be analyzed and compared to actual automotive systems found in today's automobile.
- Relays and Solenoid Operation and Testing
- Induction and Inductive Reactance

New Battery Technology-

- Spiral Wound Cell (Gel Cell, Absorbed Glass Mat etc.)
- Advantages & Servicing



Scan Tool Vehicle Computer Technology

- PCM Functions & Operations
- Understanding PCM Input and Output Circuits
- PCM Power and Ground requirements
- Examine PCM circuit failures, cause and effects

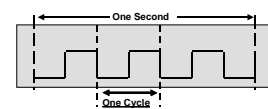
Automotive Basic Sensor Diagnosis and Testing

- Introduction to analog signals.
- How to test potentiometer sensors.
- How to test permanent magnet sensors.
- How to test NTC and PTC thermistor sensors

Understanding Input Signals & output Signals

- What is Frequency? -What is a Pull up circuit?
- What is Duty Cycle? -What is a Pull down circuit?
- What is Pulse Width? -What is Pulse Width Modulation?
- What does trigger +/- mean?

Frequency Measurement - Hz



- Hertz = the number of complete voltage cycles occurring in one second
- What is the frequency of this signal?

The objectives stated for this course are:

Upon completion of this course the student...

will be able to use his DVOM to successfully diagnose circuit and component failures.

will be able to identify simple, series, parallel and series-parallel circuits and diagnose failures.

will be able to explain the difference between dynamic and static resistance as it applies to ohm's law.

will be able to identify the value indicated on the DVOM based on displayed digits, decimal point location, scale selected and range indicator displayed.

will be able to explain and demonstrate voltage drop testing.

will be able to diagnose circuit or component failures using min-max-averaging and touch hold features of the DVOM

will be able to successfully measure frequency, pulse width modulated and duty cycle signals

Bring your DVOM (and/or DSO) and Inductive Current Probe!

EAST TRAINING

BATTERY, STARTING, & CHARGING SYSTEM DIAGNOSIS COURSE# BF 519 1 DAY

This class reviews electrical concepts—atomic structure, charges, magnetism, and Digital Volt Ohmmeter use. The students will participate in practical application of Ohm's Law during hands-on sessions using table mounted electrical circuit training aids, and on vehicles. We will review starting and charging system theory, operation, and diagnosis and will cover common, and not so common, starting and charging system failures. Learn about battery construction, testing, and checking for high resistance connections. Also covered is diagnosis of electrical failures using wiring diagrams.

This is a hands on class, bring your DVOM/DMM!

Topics Covered-

Electricity & Electronics- Metric Units of Measurement, Electrical principles—atomic structure, charges, magnetism. Practical application of Ohm's and Kirchhoff's laws, Induction and inductive reactance, AC & DC Voltage signals, Induction and inductive reactance, simple, series, parallel and series-Parallel circuits.

System testing- Starter System & Component Testing, voltage drop testing, battery construction, and testing - State of Charge Test, Open circuit voltage test methods, Load and capacitance Testing, Parasitic draw testing. Charging System Operation & Testing, Rectification.

Electrical failures- Charging circuit, Cooling fan circuit, Asian PFI & TBI circuits, Airbag circuit, PCM circuit

Classroom exercises- Voltage drop, amperage, and resistance testing- on electrical simulator boards. Voltage and frequency measurements- on sensor simulators. Demonstration of half wave and full wave rectification on a simulator board.

In shop exercises- Voltage drop testing of battery, starter, and alternator circuits; OCV testing, component amperage draw testing. Testing for alternator AC ripple and coolant electrolysis.



The objectives stated for this course are:

Upon completion of this course the student...

Given a properly functioning DVOM the student will be able to measure voltage, amperage, and resistance in starting, charging and lighting circuits.

will be able to explain and demonstrate voltage drop testing in starting, charging and lighting circuits.

will be able to perform battery OCV and load tests, charging system output, starter draw tests and interpret the results.

will be able to properly test for excessive alternator AC ripple and coolant electrolysis.

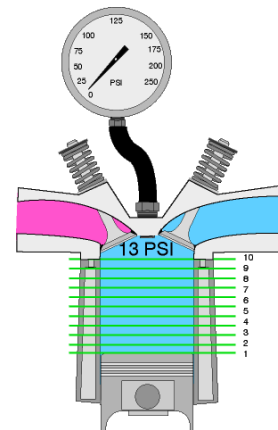
will be able to perform parasitic draw testing.

ENGINE PERFORMANCE DIAGNOSIS & TESTING COURSE# BF 522 1 DAY

Engine Mechanical

- Engine Theory / Thermodynamics
- Compression Theory and Diagnosis
- Volumetric Efficiency
- Engine Vacuum Theory and Diagnosis
- Effects of Valve Timing on Compression and Vacuum

The students will perform hands-on exercises using compression and vacuum gauges.



Air/Fuel Mixture

- Five Gas Theory
- Exhaust Gas Analysis
- Understanding Fuel Trim.
- Analyzing Fuel Control using scan-tool parameters

The students will perform hands-on exercises using scan tools and infrared analyzers where applicable.

Understanding Auxiliary Emission Controls

- PCV Systems
- A.I.R. Systems
- Exhaust Gas Recirculation systems
- Evaporative systems.
- Catalytic Converter

The objectives stated for this course are:

Upon completion of this course the student...

will be able to properly perform cranking compression tests, and interpret the results.

will be able to properly perform running compression tests, and interpret the results.

will be able to explain the differences between cranking and running compression.

will be able to perform cranking and running vacuum tests and properly interpret the results.

EAST TRAINING

IGNITION SYSTEM THEORY & TESTING

COURSE# BF 527

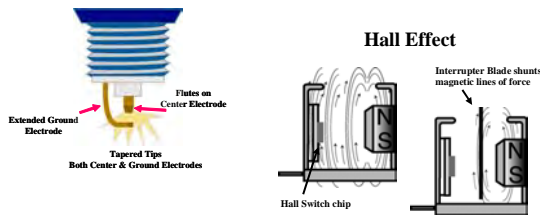
1 DAY

Magnetic Induction, Theory and Effects

- Magnetic Lines of Force
- Relationship of Magnetism and Electricity
- Transformers (Ignition Coil)
- Permanent Magnet Sensors
- Hall Effect switches

Semiconductor Theory and Effects

- Diodes
- Transistors
- Solid State Devices
- Optical Sensors



Ignition System Theory and Analysis

- Ignition Primary circuit operation and analysis
- Ignition Secondary circuit operation and analysis

The students will perform hands-on Ignition waveform pattern analysis using engine analyzers, DSO Lab Scope, or graphing meter (where applicable).

Ignition System Triggering and No-Spark Diagnosis

- Creative methods to substitute an electrical signal to quickly check major ignition system components. (Methods and possibilities vary with particular systems.)
- Instructions for assembling shop built testing tools.

The students will perform hands-on testing using commonly found tools.

The objectives stated for this course are:

Upon completion of this course the student...

will be able to explain magnetic fields and induction as related to ignition operation.

will be able to explain transistor operation and use in ignition circuits.

will understand Circuit Switching (points & transistor)

will understand the theory and methods used for triggering- Hall Effect, magnetic, & Optical

will be able to identify the various types of spark distribution systems used today- DI, EI, Coil Over Plug, and Coil Near Plug.

Bring a DSO, or Graphing meter.

SCAN TOOL OPERATION & DIAGNOSTICS

COURSE# BF 516

1 DAY

Hands-on: Bring a Scan tool and DMM.

Scan Tool Features and Options OBD-I

- Retrieval of DTC's (Codes)
- Parameter Values
- Bi-Directional Testing
- Hands-on testing using Scan-tools.

Scan Tool Features and Options Generic OBD-II

- Retrieval of DTC's (Codes)
- Parameter Values
- Freeze Frame
- Readiness Monitors
- Hands-on testing using Scan-tools

Scan Tool Features and Options OEM OBD-II

- Retrieval of DTC's (Codes)
- Parameter Values
- Fail Records GM only if Applicable
- Bi Directional Testing
- Test Modes-
- Other Systems
- Transmissions
- Evaporative
- EGR
- Hands-on testing using Scan-tools

Scan Tool Vehicle Computer Technology

- PCM Functions & Operations
- Understanding PCM Input and Output Circuits
- PCM Power and Ground requirements
- Examine PCM circuit failures, cause and effects

Automotive Basic Sensor Diagnosis and Testing

- Introduction to analog signals.
- How to test potentiometer sensors.
- How to test permanent magnet sensors.
- How to test NTC and PTC thermistor sensors

The students will perform hands-on exercises using DMM's on sensor simulators, and vehicles.

The objectives stated for this course are:

Upon completion of this course the student...

will be able to explain the major differences between OBD-I and OBD-II requirements.

will be able to explain OBD-I regulations and standards.

will be able to connect and properly set a scan tool to read system sensor parameters, diagnostic trouble codes (DTC's), freeze frame data, and monitor readiness status, and interpret results.

Bring a Scan tool and DMM.

EAST TRAINING

ENHANCED DVOM/DIAGNOSTICS

COURSE# BF 511

1 DAY

Hands-on: Bring a DVOM/DMM!

- DVOM-DMM Functions Review
- Proper Scaling/ ranging of a meter
- Reading and comprehending the meters values/scales

The students will perform hands-on exercises using DMM's to select proper meter functions, probe leads, and port locations.

Electricity Review

- Volts / Amps / Ohms: The definition of all three components that create electromotive force.
- Structure of the Atom.
- Theory- correcting misguided assumptions and myths.
- Practical application of Ohm's Law and its importance to successful electrical diagnosis.

The students will perform hands-on exercises using DMM's on simulators and vehicles. Amperage measurements and testing will be performed to reinforce Ohm's Law.

Electrical Circuits Review

- Voltage Dividing Circuits
- Parallel Circuits
- Series-Parallel Circuits
- Static vs. Dynamic Testing
- Circuits will be analyzed and compared to actual automotive systems found in today's automobile.



Scan Tool Vehicle Computer Technology

- PCM Functions & Operations
- Understanding PCM Input and Output Circuits
- PCM Power and Ground requirements
- Examine PCM circuit failures, cause and effects

Automotive Basic Sensor Diagnosis and Testing

- Introduction to analog signals.
- How to test potentiometer sensors.
- How to test permanent magnet sensors.
- How to test NTC and PTC thermistor sensors

Understanding Input Signals & output Signals

- What is Frequency? -What is a Pull up circuit?
- What is Duty Cycle? -What is a Pull down circuit?
- What is Pulse Width? -What is Pulse Width Modulation?
- What does trigger +/- mean?

Practical Applications of Amperage Testing

- Understanding current flow in a live circuit
- Using amperage measurements to diagnose electrical failures.
- Parasitic draw testing
- Inductive current probe testing (Low and High amp)
- Calculating and confirming PCM Controlled Component values (Solenoids, relays, motors, etc.)

Bring your DVOM/DMM and Inductive Current Probe!

EVAPORATIVE EMISSIONS SYSTEMS OBD-II

THEORY OPERATION & DIAGNOSIS

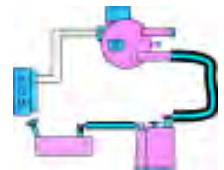
COURSE# BF 535

1 DAY

Enhanced and Non-enhanced evaporative systems will be included on import, and domestic vehicles. Includes comprehensive coverage of operational theory, system components, & component monitoring strategies on systems with and without leak detection pumps. Evaporative system diagnosis and DTC repairs will be covered. Fuel cap testing principles and procedures will also be included. Bring a Scan tool and/or DVOM!

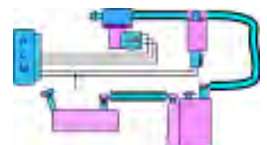
We will cover...

- Major Systems Controlling Emissions
- HC's - VOC's
- Automobile VOC Sources
- Crankcase HC Emissions
- Tailpipe HC Emissions
- Evaporative HC Emissions
- Allowable Evaporative Losses
- FTP- Grams per mile
- Vapor Canister System Operation
- Formation of Ozone & Tropospheric Ozone
- Photo-disassociation of NO₂
- Balanced Cycled Reactions
- OBD-II Component Monitoring
- Enabling Criteria
- EVAP System Monitoring Components
- HEGO, Fuel trim, Evap fuel level,
- Fuel tank pressure sensors
- Pressure & Vacuum measurements
- Chrysler Leak detection pumps



System diagnostics

- Methods of Checking for leaks (Incl. Smoke machines)
- PCM component control
- Component testing
- LDP - Leak Detection Pump
- NVLD Systems
- Fuel Caps
- Diagnostic Tools
- Case Studies- Domestic & Import Vehicles
- System Specific component testing
- Evap & Canister purge solenoids
- Vapor Management Valves
- Ford Evaporative Systems
- 2000 Ford E-150 Case Study
- GM Evap System Monitoring
- Toyota Evap Monitoring
- 2003 Toyota Highlander
- Third EVAP Valve
- Toyota .020" Leak Detect



In shop exercises- Scan tool, DSO, DVOM diagnostics. Frequency and duty cycle measurement of solenoids and relays. Obtaining diagnostic trouble codes (DTC's), obtaining and analyzing evap system freeze frame data, and monitoring evap readiness status

Bring Your Scan Tool and/or DVOM!!

EAST TRAINING

ELECTRONICS IN THE MODERN AUTOMOBILE

COURSE# BF531

1 DAY

This is a Hands-On Class- Bring your DVOM!

Explains the application of semiconductors and other electronic components in the automobile of today—

Topics covered include: Construction, function, identifying ratings, and testing of the following components: Diodes— for rectification, circuit protection, current control, Zener diodes (for voltage regulation), Relays and solenoid circuits.

Also, Bipolar Transistors— NPN & PNP used for switching and amplification, SCR's— (Silicon Controlled Rectifiers) Resistors— Carbon composite, Metal film, Wire wound, Variable Resistors (Rheostats, Potentiometers, Thermistors), Capacitors— Ceramic, Mica, Electrolytic, R/C circuits, Coils & transformers, Photoelectric devices— photodiodes, phototransistors, LED's. Integrated circuits will also be introduced (with emphasis this class on the 555 timer chip). Animation is used to explain P & N material and diode function.

ESD— what it is and how to guard against damage of solid-state devices during diagnosis and service

Tools used for electronic diagnosis—

DSO's, Analog Scopes, DVOM/DMM's, Logic Probes, Logic Pulsers, LED testlights, and discrete component testers will also be discussed.

Classroom exercises— The student will build circuits using tabletop electronic trainers. Diodes, Zener Diodes, LED's, Relays, and Transistor Circuits will be built and analyzed.

Several different automotive electronic circuits will be evaluated, analyzed, and explained. Schematics will be presented describing construction of several useful shop diagnostic tools, which can be assembled using knowledge learned in this course.

Due to the amount of time spent building circuits on the electronic trainers in the classroom, there will be no shop time.

Bring your DVOM!



ADVANCED ENGINE PERFORMANCE

COURSE# BF 517

1 DAY

Note: This class is excellent prep for the A8 and L1 tests. Technicians must be certified in Engine Performance A8 prior to attempting to certify for the L1 Advanced Engine Performance test. Also excellent for a review of the latest engine performance and OBD-II diagnosis techniques.

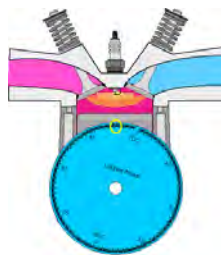
We will cover...

- Power-train diagnostics including performing and interpreting compression readings, chemistry of combustion, 5-gas theory (How HC, CO, NO_x, CO₂ are formed, and how their measurement, along with O₂, can be used for diagnostics.)
- I/M failure diagnostics for Constant Volume Sampling, Pressure Purge testing, I/M 240 and ASM testing.
- OBD-II Theory, operation and diagnostics.
- Also covered will be a review of Emission Control Systems operation (EGR, AIR, PCV, Evap etc.).

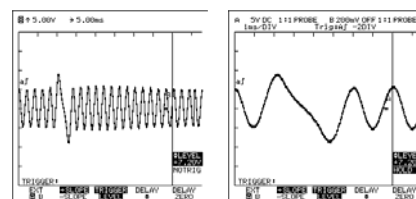
ASE test writers developed a generic OBD-II engine control system for use in the L1 test. This vehicles system is excellent for explaining engine performance related systems. The composite vehicle systems and schematics used in the L1 test will be reviewed and explained in great detail- components, inputs, outputs, scan diagnostics, sensor wiring etc.

- How the composite vehicle questions are presented
- The proper approach when answering.
- Test taking skills and tips will be offered.
- Many practice questions will be reviewed.

Bring Your DVOM!!



Crankshaft Sensor



Ford 1996 4.0 V-6

EAST TRAINING

INTRODUCTION TO HYBRID VEHICLE SERVICING

COURSE# BF541

1 DAY

Featuring the Honda Insight, Toyota Prius, and Ford Escape Hybrids

Hybrid vehicles present an exciting new challenge and opportunity for the automotive service industry. Hybrids take many forms, and incorporate many new technologies and never before seen systems. Many components originally designed for use in the 42 volt system are being put to use in the much higher voltage Hybrid vehicles. Fuel cell equipped hybrids are a reality and are almost ready for production. Improvements in battery design and chemistry has breathed new life into PHEV's, or Plug In Hybrid Electric Vehicles. This is the first in a series of courses designed to present you with the knowledge required to successfully diagnose and service this latest addition to our industry.

What constitutes a Hybrid Vehicle, The history and evolution of today's Hybrid.

Course description:

Motors:

Operation and theory- Electric Motors, Electric Generators, Eddy Brake Motors, Brushless Motors, ISA/ISG, Battery modules, capacitors, AC/DC converters, regenerative braking, Idle stop systems.

Internal Combustion Engine Types and Designs:

Five Stroke, VVT, Cylinder Offset, and Lean Burn.

Transmission Overview:

CVT, Manual, and PSD (Power Split Device)

Hybrid Power Train Types:

Series, Parallel, Series Parallel

How to operate a Hybrid:

Starting/Shutting down, Emergency Shut/down, Disabling auto start systems

Hybrid Safety, Tools, and Equipment:

Recognizing high voltage system components, Identifying dangers, Recognizing High Voltage cables.

Test equipment, Meter and accessory requirements-Does your present equipment meet the requirements?

Instrument Display:

Icon Recognition, Gauges / Indicators / Warning- What do they mean?

Maintenance/Serviceable Items:

Performing maintenance and repairs- cautions to observe.

Many of the same Maintenance services required on conventional vehicles are required on hybrids. A knowledge of safety precautions will ensure a safe environment when performing these services: Lube, Oil, Filter changes, Trans Service, Coolant Service, Brake Service, Tire Service, Tune Up.

Introduction to Hybrid DTC's:

This portion of the course will open your eyes to future types of repairs.

Review some new types of Diagnostic Trouble Codes

These new codes will lead us to new diagnostic procedures.

Hybrids to come

What the future looks like for the Hybrid market.

The objectives stated for this course are:

Upon completion of this course the student...

will understand the types of powertrain designs used.

will understand the types of Motors/Generators used.

will be able to identify high voltage components.

will have an understanding of the basic maintenance services necessary on Hybrid vehicles.

will have an understanding of safety concerns when servicing Hybrid vehicles.

will understand the methods used to disable high voltage systems for service.

will understand the differences in tool & equipment requirements for Hybrid vehicle service.



This is the first in a series of courses which will cover the individual Hybrid models in more depth as they develop and become more popular.

**This is a Hands-on Class:
Bring a DVOM/DMM and a Low Current Inductive Probe!**

This class covers electrical concepts including: atomic structure, charges, magnetism, and Digital Volt Ohmmeter use. The students will participate in practical application of Ohm's Law during hands-on sessions using table mounted electrical circuit training aids, and on vehicles. We will cover starting and charging system theory, operation, and diagnosis and will cover common, and not so common system failures. Learn about battery construction, testing, and checking for high resistance connections and diagnosis of electrical failures using wiring diagrams. Some of the topics covered are:

Digital Meters

Meter construction and function, manual and auto ranging meter scaling and interpretation, High impedance digital meters- why they are needed, and does yours qualify? Circuit damage caused by using the wrong meter. Meter accuracy, measuring EMF, intensity of current, electrical resistance, static Vs. dynamic resistance, diode test function, true RMS vs. average responding meters, Zero-delta-relative modes, trigger, measuring frequency, pulse width, and duty cycle, meter maintenance.

- DVOM-DMM Functions Review
- Proper Scaling/ ranging of a meter
- Reading and comprehending the meters values/scales
- Metric Units of Measurement

Advanced meter features

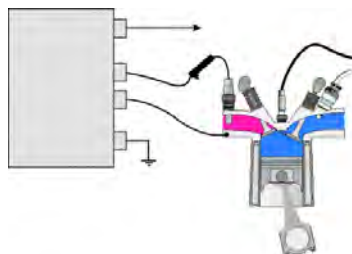
How and when to use-Min-Max-average-Recording, Touch-hold function. Power up options- Disable auto off, High accuracy 1 ms response, Low ohms.



Digital Sensors

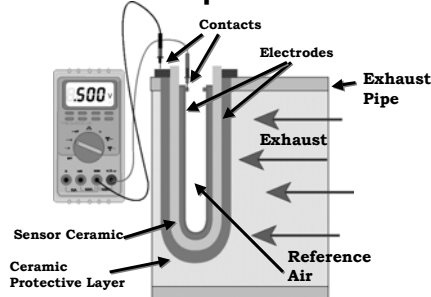


Analog Sensors



Oxygen Sensor Testing

Sensor Operation



Electricity

- Volts / Amps / Ohms: The definition of all three components that create electromotive force.
- Structure of the Atom.
- Theory- correcting misguided assumptions and myths.
- Practical application of Ohm's Law and its importance to successful electrical diagnosis.
- Practical application of Kirchhoff's laws
- Induction and inductive reactance
- AC & DC Voltage signals
- Induction and inductive reactance

Semiconductors

Diode and transistor construction, function, identification, application and out-of-circuit testing. NPN & PNP transistors, small signal, rectifier, clamping, and avalanche diodes are discussed.

Electrical Circuits Review

- Voltage Dividing Circuits
- Parallel Circuits
- Series-Parallel Circuits
- Static vs. Dynamic Testing
- Circuits will be analyzed and compared to actual automotive systems found in today's automobile.

Scan Tool Vehicle Computer Technology

- PCM Functions & Operations
- Understanding PCM Input and Output Circuits
- PCM Power and Ground requirements
- Examine PCM circuit failures, cause and effects

(Continued next page)

Automotive Basic Sensor Diagnosis and Testing

- Introduction to analog signals.
- How to test potentiometer sensors.
- How to test permanent magnet sensors.
- How to test NTC and PTC thermistor sensors
- Oxygen Sensor testing

Understanding Input Signals & output Signals

- What is Frequency? -What is a Pull up circuit?
- What is Duty Cycle? -What is a Pull down circuit?
- What is Pulse Width? -What is Pulse Width Modulation?
- What does trigger +/- mean?

Practical Applications of Amperage Testing

- Understanding current flow in a live circuit
- Using amperage measurements to diagnose electrical failures.
- Parasitic draw testing
- Inductive current probe testing (Low and High amp)
- Calculating and confirming PCM Controlled Component values (Solenoids, relays, motors, etc.)

System testing

Starter System & Component Testing, voltage drop testing, battery construction, and testing - State of Charge Test, Open circuit voltage test methods, Load and capacitance Testing, Parasitic draw testing. Charging System Operation & Testing, Rectification.

Electrical failures

Charging circuit, Cooling fan circuit, Asian PFI & TBI circuits, Airbag circuit, PCM circuit

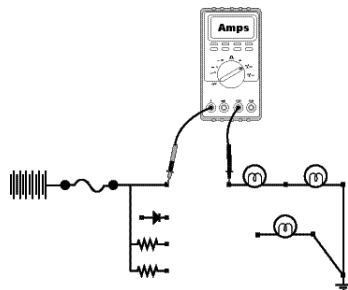
Classroom exercises- Voltage drop, amperage, and resistance testing- on electrical simulator boards. Voltage and frequency measurements on sensor simulators. Demonstration of half wave and full wave rectification on a simulator board.

In shop exercises- Voltage drop testing of battery, starter, and alternator circuits; OCV testing, component amperage draw testing. Testing for alternator AC ripple and coolant electrolysis.

Bring your DVOM/DMM and Inductive Current Probe!



Non-intrusive Amperage Testing



Intrusive Amperage Testing



Extensive Hands-on Testing both on circuit boards and on vehicles



CAT III Meter

**New courses are always under development.
Tell us what you need!**

Featuring the Toyota Prius, Camry and Lexus RX400h Hybrids.

Hybrid vehicles present an exciting new challenge and opportunity for the automotive service industry. Hybrids take many forms, and incorporate many new technologies and never before seen systems. Many components originally designed for use in the 42 volt system are being put to use in the much higher voltage Hybrid vehicles.

This is the first in a series of manufacturer specific courses designed to present you with the knowledge required to safely and successfully diagnose and service New Technology Vehicles. The purpose of this course is to give the Technician an overview of the various systems used in the Toyota Hybrid Vehicles. Future courses will delve deeper into the diagnosis and repair of the individual systems. As you will see, Toyota has been ahead of the curve and is currently licensing their Hybrid technologies to other manufacturers, both foreign and domestic, (Lincoln/Mercury, Ford, Nissan and Mazda) for use in their own lines of Hybrid vehicles.

A knowledge of proper safety precautions will ensure a safe environment when performing these services: Lube, Oil, Filter changes, Trans Service, Coolant Service, Brake Service, Tire Service, Tune Up.

Toyota Course Highlights

Motors:

Operation and theory-

Electric Motors, Electric Generators, Eddy Brake Motors, Brushless Motors, ISA/ISG, Battery modules, capacitors, AC/DC converters, regenerative braking, Idle stop systems.

Internal Combustion Engine Types and Design enhancements:

Five Stroke, VVT, Cylinder Offset, and Lean Burn.

Transmission Overview:

Toyota PSD (Power Split Device) MG1 & MG2 operation.

Hybrid Power Train Types:

Series, Parallel, Series Parallel

How to operate a Hybrid:

Starting/Shutting down, Prius Key systems- Electronic Key and optional Smart start/Smart Entry Systems. Emergency Shut/down, Disabling auto start systems.

Systems incorporated to attain AT-PZEU (Advanced Technology- Partial Zero Emission Vehicle) status.

Hybrid Safety, Tools, and Equipment:

Recognizing high voltage system components, Identifying dangers, Recognizing High Voltage cables. Test equipment, Meter and accessory requirements-

Instrument Display:

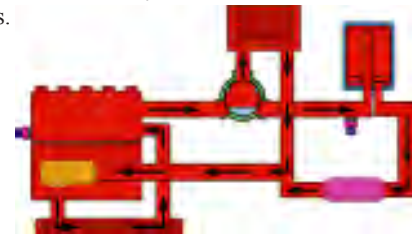
Icon Recognition, Gauges / Indicators / Warning- What do they mean?

Maintenance/Serviceable Items:

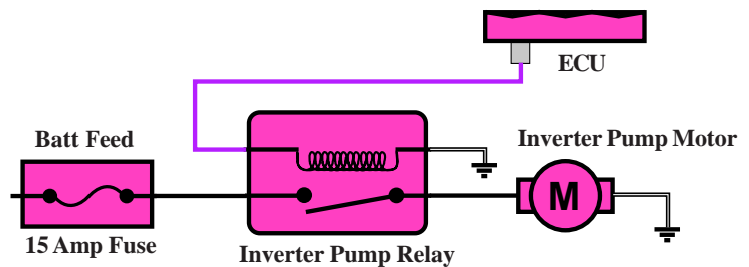
Performing maintenance and repairs- cautions to observe. Safely servicing vehicles with “Hot Storage” cooling systems, Multi-Water pump/Water Valve Systems, Electric water pump circuit operation and Power Inverter cooling systems.

Other Systems covered:

Toyota Hybrid HVAC System Servicing.
Tire Pressure Monitoring System
Exterior lighting System Servicing.



Hot Coolant Storage System



Inverter Water Pump Schematic

The objectives stated for this course are:

Upon completion of this course the student...

- will understand the types of powertrain designs used by Toyota.*
- will understand the operation of Motors/Generators and planetary units used in the PSD.*
- will be able to identify high voltage components.*
- will have an understanding of the basic maintenance services necessary on Toyota Hybrid Vehicles.*
- will have an understanding of safety concerns when servicing Toyota Hybrid Vehicle Systems.*
- will understand the methods used to disable high voltage systems for safe service.*
- will understand the requirements for tools & equipment when servicing Toyota Hybrid vehicles.*



MGU- Motor/Generator Unit

Featuring the Toyota Prius, Generation 2 Hybrid.

Toyota hybrid vehicles (and ALL Hybrids) present an exciting new challenge and opportunity for the automotive service industry. Many shops are concerned about servicing these vehicles. An understanding of proper procedures, equipment, parts, and lubricants will make servicing these vehicles a safe and profitable experience.

This is the second in a series of manufacturer specific courses designed to present you with the knowledge required to safely and successfully diagnose and service Advanced Technology Vehicles. The purpose of this course is to give the Technician a review of the various systems used in the Toyota Hybrid Vehicles, then provide more specific procedures for the more common service procedures you will encounter. Future courses will dig deeper into the diagnosis and repair of the individual systems. (Note: Prerequisite courses are BF541 & BF570.)

**Toyota Prius Gen 2 Course Highlights***Review of:***Motor Operation and theory-**

Electric Motors, Electric Generators, Eddy Brake Motors, Brushless Motors, ISA/ISG, Battery modules, capacitors, AC/DC converters, regenerative braking, Idle stop systems.

*Internal Combustion Engine Types and Design enhancements:**Transmission Overview:*

Toyota PSD (Power Split Device) MG1 & MG2 operation.

*Hybrid Power Train Types:**How to operate a Hybrid:*

Starting/Shutting down, Prius Key systems- Electronic Key and optional Smart start/Smart Entry Systems. Emergency Shut/down, Disabling auto start systems.

Systems incorporated to attain AT-PZEU (Advanced Technology- Partial Zero Emission Vehicle) status.

*In-depth coverage of:**Hybrid Safety, Tools, and Equipment:*

Recognizing high voltage system components, Identifying dangers, Recognizing High Voltage cables.

Test equipment- insulated tools, meter and accessory requirements- Including CAT III DVOM and insulation testing Meters (such as- Fluke 1503, 1507 & 1508) to test for insulation breakdown and leakage.

When to use Insulated Gloves (1000 volt certified) and requirements for testing and recertification of gloves.

Insulated Rescue Hook.

Instrument Display:

Icon Recognition- Gauges / Indicators / Warning lights- What do they mean?

Maintenance/Serviceable Items:

Performing maintenance and repairs- cautions to observe.

Proper procedures to safely disable the high voltage/current system using the Service Plug.

Disconnecting the HV battery for service.

Auxiliary Battery Removal, servicing, charging.

Proper procedure for Changing Engine Oil.

Safely servicing vehicles with "Hot Storage" cooling systems, Multi-Water pump/Water Valve Systems.

Transaxle and Inverter Coolant Service. (Improper procedures can cause expensive failures.)

Assembling an inexpensive alternative to Toyota factory scan tool, necessary to operate inverter water pump during refill.

Transaxle fluid change procedures.

Tire rotation procedures and TPMS reset.

And Much More!

*The objectives stated for this course are:**Upon completion of this course the student...*

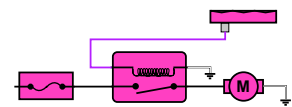
will be able to identify high voltage components.

will have an understanding of safety concerns when servicing Toyota Hybrid Vehicle Systems.

will understand the methods used to disable high voltage systems for safe service.

will understand the requirements for tools & equipment when servicing Toyota Hybrid vehicles.

will have an understanding of the most common maintenance services necessary on Toyota Hybrid Vehicles.

**Insulation Tester****Hot Coolant Storage System
with 3 way valve****Inverter Water Pump Schematic**

EAST Courses are Fast-Paced classes with lots of information packed into the time available. For a greater understanding of the subject matter, some Technicians would rather cover less material, allowing more time to cover theory and perform even more hands on exercises. If your group would be interested in this approach, ask about our BF100 Series of courses!!

BF119.1 Electrical Theory BSC Part 1
BF119.2 Electrical Theory BSC Part 2
BF122.1 Engine Performance Diagnosis Part 1
BF122.2 Engine Performance Diagnosis Part 2
BF127.1 Ignition System Principles
BF127.2 Ignition System Diagnosis
BF116.1 OBD-II System Principles
BF116.2 OBD-II Scan-Tool Troubleshooting

BF111.1 Electrical Principles
BF111.2 Electrical Troubleshooting
BF135.1 Evaporative Systems Theory
BF135.2 Evaporative Systems Diagnosis
BF131.1 Principles of Electronics Part 1
BF131.2 Principles of Electronics Part 2
BF121.1 Brake System Principles
BF121.2 Anti Lock Brake System Principles



EAST TRAINING INC.

The EAST client base includes:

Tool/Equipment Sales

- Snap on tools
- MATCO Tools

Train-The-Trainer (T³)

- Lincoln Technical Institute (Union & Mahwah NJ, Phila. PA, Brooklyn & Queens NY, Indianapolis)
- United States Marine Corps (Aberdeen MD Proving Grounds)
- NACAT – North American Council of Automotive Teachers

Industry Associations

- ASA of South Carolina
- IGONC- Independent Garage Owners of North Carolina

Independent Shop Associations we helped form/establish Training

- Top Tech Training of South Carolina
- WV Panhandle Garage Owners assn.
- Business development group of South Hampton Roads (VA)
- Top Tech Training of Wilmington NC
- Top Tech Training of Elmira NY

Auto Parts

- AutoZone
- NAPA Auto Parts
- Advantage/Hahn Auto Value Parts
- CARQUEST Auto Parts
- AutoPart International
- Auto Supply Company, Inc.
- Consumer Auto Parts
- Richard's Auto Parts

Repair chains

- Bridgestone Firestone USA (NE, SE and Western Zones)
- Midas Car Care
- Meineke Car Care
- Wheel Works (CA)
- American Car Care/ Jack Williams Tire

Fleets

- FLAGFA-Florida Assn. of Govt. Fleet Administrators
- SCGFMA- South Carolina Governmental Fleet Managers Assn.
- City of Hampton VA Fleet Maintenance
- City of Jacksonville NC Fleet Maintenance
- Federal Bureau of Investigation (FBI)

EAST TRAINING IS AN ASE CERTIFIED CASE PROVIDER

&

AN ASE BLUE SEAL OF EXCELLENCE

RECOGNIZED SUPPORT ORGANIZATION 2001-2012

ATMC "EXCELLENCE IN TRAINING" 2002 AWARD WINNER



Enhanced Automotive Systems Technology, Inc.

Technical Training Courses

Classroom/ facility Set-up Information

The classroom should be clean, comfortable, and well lit for the students. For hands on classes, tables and chairs will be required. Many EAST classes require tabletop training aids, which require wires to be run between tables. Eight to ten foot folding tables and chairs are required (not student desk style tables). The accompanying diagram shows suggested classroom setup.

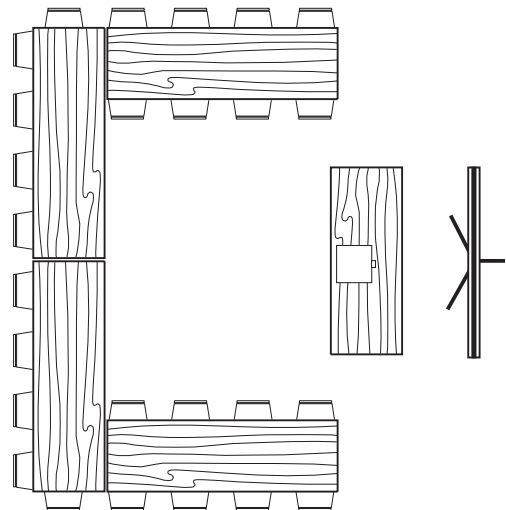
Shop area

A shop area will be required for hands-on activities. The shop must be clean, safe, and equipped with a ventilation system and, if possible, a lift. The class location may be a Vo-tech school, Community College, or even a repair shop facility, if it meets the requirements.

How the classroom is setup depends on a number of variables:

- the course being taught.
- the number of students in the class.
- the type of facility involved.

In most courses, (electrical systems, electronics, DVOM, DSO Etc.) it is necessary to connect a regulated power supply line and wiring for the students' meters, scopes, and training aids. The instructor needs to be able to walk to the students easily, and help them with set-ups and exercises. For that, the diagram shown below is the best way to proceed. Additional tables can be added to provide enough seating for the number of students in the class.



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"We're Proud of Our Blue Seal Team"

EAST Training Inc.

For more information contact us at 856.810.4075 or 888.979.9920
Visit us on the web at WWW.EASTTRAINING.COM