

# ATech

**Automotive Technology**

An ASE™ Certified Training Provider



*Proud Member of*

**Training Managers Council**  
ATMC



VOLUME  
7

**ATech Training, Inc.**  
**A Veteran Owned and Operated American Company**

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## NATEF GROUP

### Automobile

#### I. Electrical / Electronic Systems

• Troubleshooting Trainer - 1801B	• S.E.T. Virtual Trainer - 18002VT3	24-42
• Courseboards - 1810A, 1820A, 1830, and 1840	• Starting System - 811C	
• Fault Board - 1800FB	• Charging System - 812C	
• Interactive Keypad - 1802	• Lighting System - 821C	
• Automotive Electricity Courseboard - 1811	• Wiper / Washer System - 830C	
• Automotive Electronics Courseboard - 1821	• Power Window System - 840C	
• S.E.T. - 18002TR	• Power Door Lock System - 850C	
• Optional Submounts	• Power Seat System - 860C	
• S.E.T. Troubleshooting Trainer - 18002TT	• Electrical / PWM / Fault Trainer - 2210	
• S.E.T. Virtual Trainer - 18002VT1	• CAN Network System - 3802	
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#### II. Engine Performance

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# ATech's Free Products and Services

To assist and inform all automotive and diesel educators, we offer the following:

- **INSTRUCTOR WORKSHOPS**

These workshops provide technical seminars on topics of new technology and are presented at locations nationwide. Class sizes are limited to maximize individual attention.

- **FACTORY TRAINING**

ATech offers "factory" instructor training at its facility in Walton, Kentucky. Contact us for on-site training options.

- **E-NEWSLETTERS**

Newsletters contain information about current technology and anticipated future technology, as well as other items of interest to technicians, instructors, students, and administrators.

- **CONSULTING SERVICES**

Because of our continual involvement with the automotive industry and educational associations, we offer informed, up-to-date assistance to help you develop or upgrade your automotive and diesel programs.

- **WEB SITE**

Contains newsletters, upcoming events, product information, employment opportunities, technical articles of interest, and new trainers. ([www.atechtraining.com](http://www.atechtraining.com))

- **SOCIAL MEDIA**

Showcases up-to-date events, new products, automotive technology news, and highlights events at schools and in the industry. Follow us on Instagram (atech\_training), LinkedIn (ATech Training), Facebook (ATech Training), Twitter (@ATech\_Training), YouTube (ATechTraining) and our LinkedIn Group (ATech Training) to stay connected. #ATech

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[sales@atechtraining.com](mailto:sales@atechtraining.com) ♦ 1.888.738.9924

# ATech's Free Products and Services

ATech Training, Inc.  
A Veteran Owned and Operated American Company  
Winner of the 2004 Automotive Training Managers Council  
"Award of Excellence in Training Programs"

## Instructor Workshops

ATech conducts instructor workshops periodically at our facility in Walton, KY. Each workshop group consists of secondary, post-secondary, and industry instructors. Technical topics and teaching techniques emphasizing hands-on instruction are presented and discussed. Over \$1,000 in books and teaching materials are given to each instructor in attendance. In addition, each workshop satisfies hours towards the annual training requirements of NATEF.



ATech Training, Inc.

## Local Attractions



Turfway Park



Great American Ball Park

Source: Northern Kentucky Convention and Visitors Bureau



Newport Aquarium

Contact ATech Training to add your name to the workshop list for consideration.



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## AUTOMOTIVE CLASSROOM

Convenient to, but separate from, the lab / shop area  
(Standard 9.6)

## ATech Trainers

Automotive Electricity / Electronics  
with Optional Computer Based Instruction

## Multimedia and E-Learning Stations

(Standards 3.2 and 12)

## Safety and First Aid

(Standards 9.2 and 9.10)

## Cleanup Area with Student Lockers

(Standard 9.8)

## Rest Rooms

For Male and Female Students  
(Standard 9.8)

## Secure Storage Area

For Tools, Parts and Supplies  
(Standard 9.7)

## Student Progress and Performance Standards

(Standards 7.6 and 7.7)

## Automotive Shop

On-Vehicle Service and Repair Work  
(Standard 7.15)

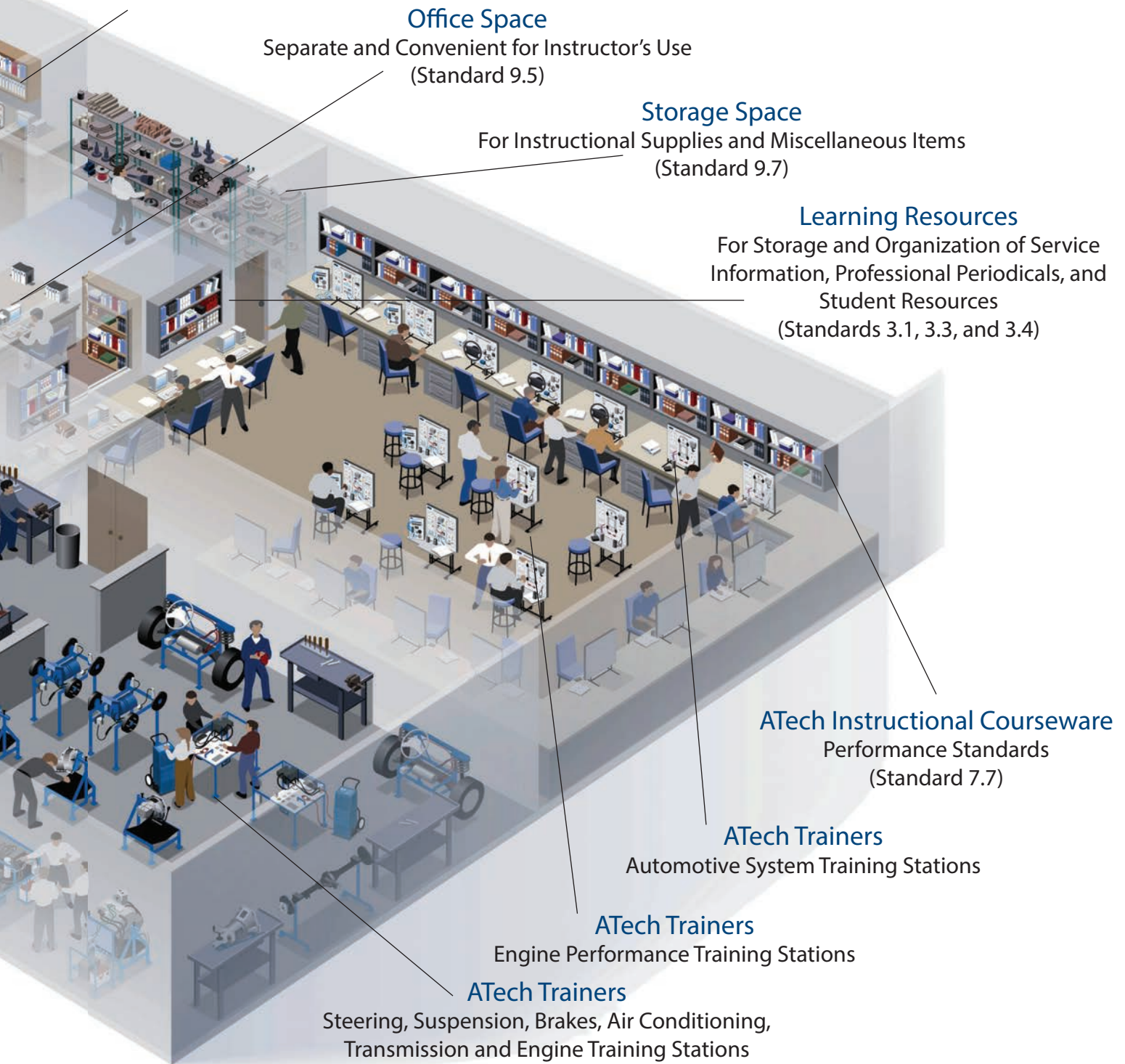


## Instructional Courseware

To advance quality and excellence in automotive service training, ATech provides trainer courseware. Each was developed to give instructors a detailed curriculum path to address all of a trainer's capabilities. Students benefit from this in-depth study and from a hands-on approach through on-trainer and on-vehicle activities. NATEF Task and Record Keeping Sheets are included to ensure current automotive service standards are covered. The courseware consists of an Instructor Guide, Student Manual, and any applicable service information and/or reference material. A courseware site license permits copy and distribution to students.

## ATech Instructional Courseware

Student-Oriented Learning Materials  
(Standard 7)



### Office Space

Separate and Convenient for Instructor's Use  
(Standard 9.5)

### Storage Space

For Instructional Supplies and Miscellaneous Items  
(Standard 9.7)

### Learning Resources

For Storage and Organization of Service  
Information, Professional Periodicals, and  
Student Resources  
(Standards 3.1, 3.3, and 3.4)

### ATech Instructional Courseware

Performance Standards  
(Standard 7.7)

### ATech Trainers

Automotive System Training Stations

### ATech Trainers

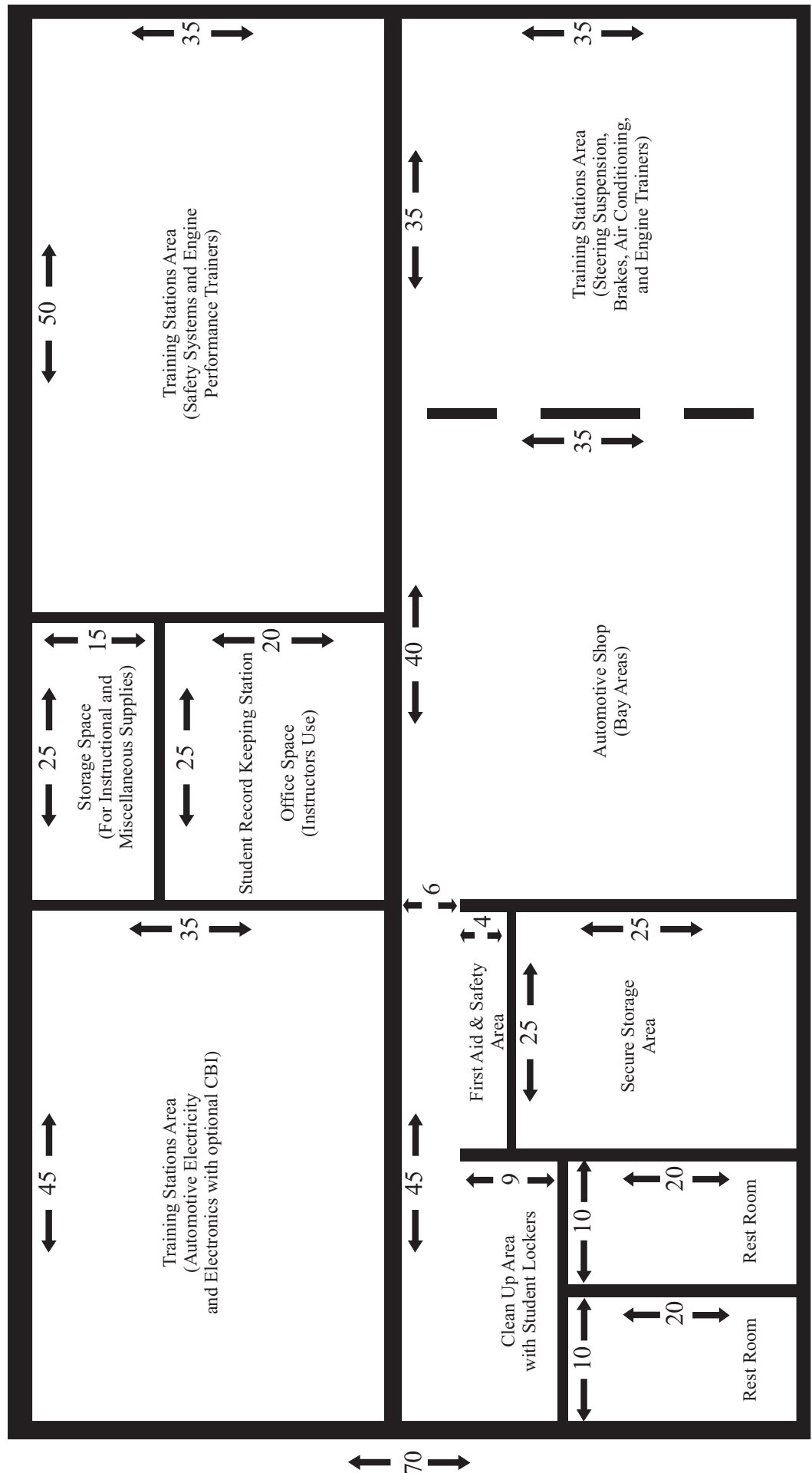
Engine Performance Training Stations

### ATech Trainers

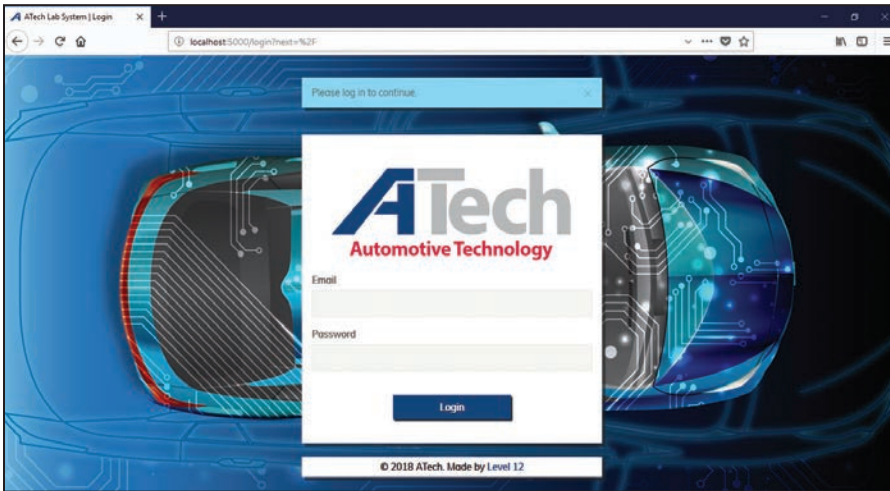
Steering, Suspension, Brakes, Air Conditioning,  
Transmission and Engine Training Stations

# Automotive Technology Lab

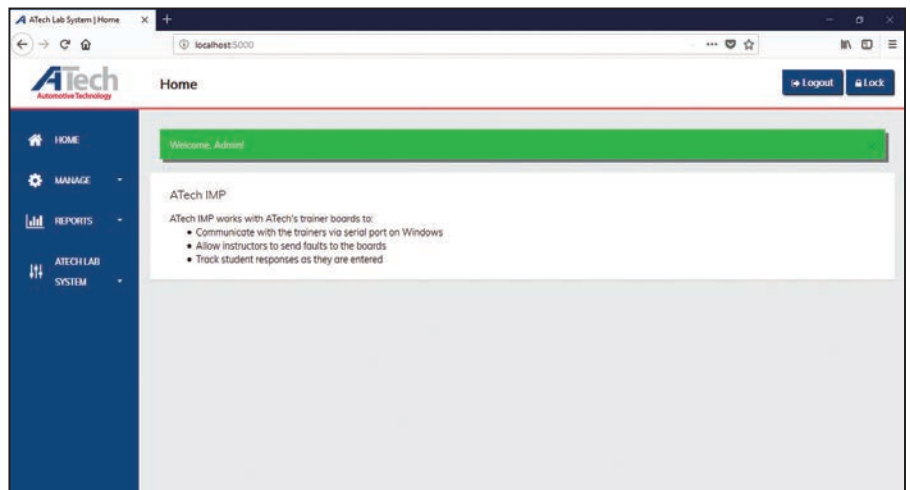
8400 Square Feet



# Instructor's Management Program (IMP)



IMP Home Screen

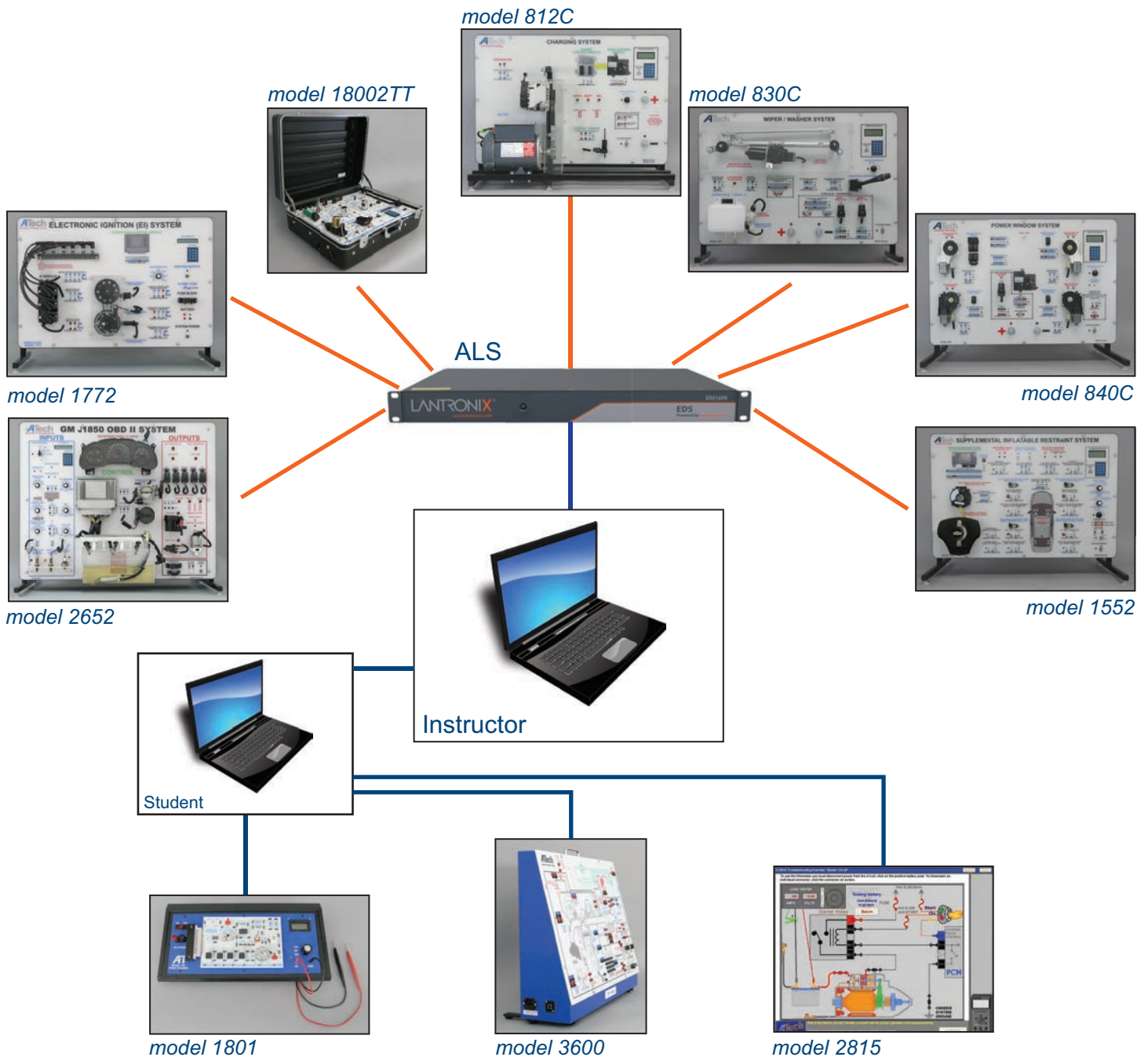


IMP Main Menu

## Compatible CBI Programs and Trainers

- 310FJ Engine Cooling Fan System
- 320FJ Blower Control System
- 640 EVAP Trainer
- 811C Starting System
- 812C Charging System
- 821C Lighting System
- 830C Wiper/Washer System
- 840C Power Window System
- 850C Power Door Lock System
- 860C Power Seat System
- 1351 A/C with Automatic Climate Control
- 1432 DELCO DBC7 ABS/TCS System
- 1552 Supplemental Inflatable Restraint System
- 1711F GM Direct Ignition System Faulted
- 1772 GM Electronic Ignition (EI) System
- 1792 Integrated Electronic Ignition System
- 1810W Automotive Electricity
- 1820W Automotive Electronics
- 18002TT GM S.E.T. Troubleshooting Trainer
- 2652 GM J1850 OBD II System
- 2815/2815N Starting System Troubleshooting
- 2816/2816N Charging System Troubleshooting
- 3610 Engine Control Fundamentals
- 3620 Engine Control Systems Operation
- 3630 Engine Control Diagnostic Fundamentals
- 3631/3631N Computer Based Troubleshooting Skill
- 3802 CAN Network Trainer

# Lab Integration



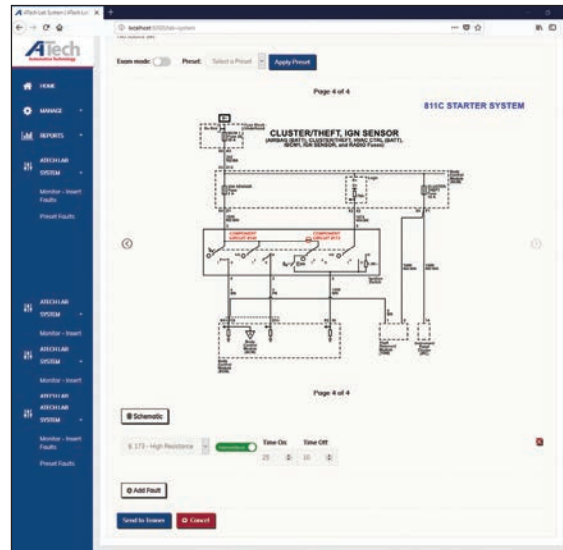
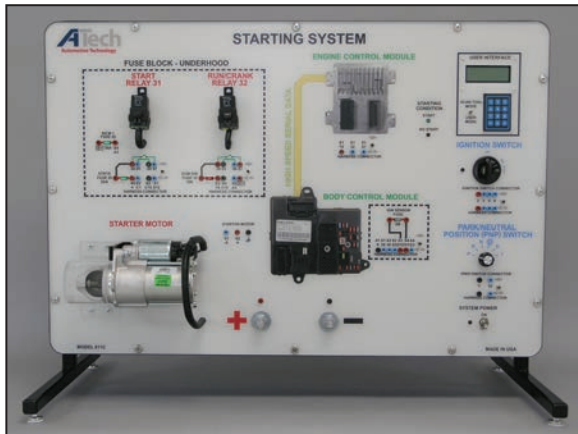
## Atech Trainers are Integrated

- Compatible with Microsoft™ Networks (no proprietary networking)
- Monitor student activities via Instructor's Management Program (IMP)
- Multiple faults can be inserted into student training system
- Add new student training systems
- Assign individual student log-in identification
- Maintain student activity records

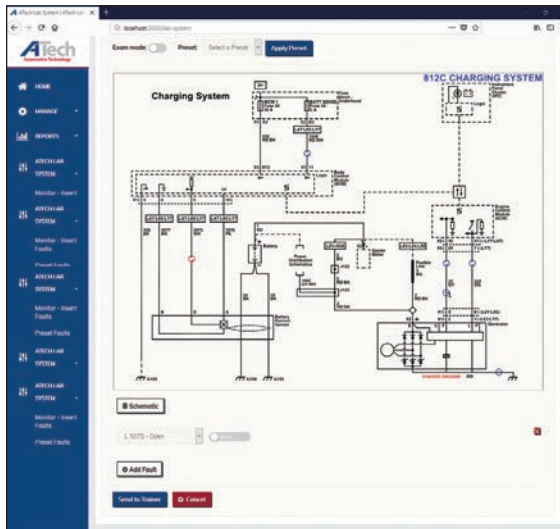
# Lab Integration

## Fault Insertion Screens Examples

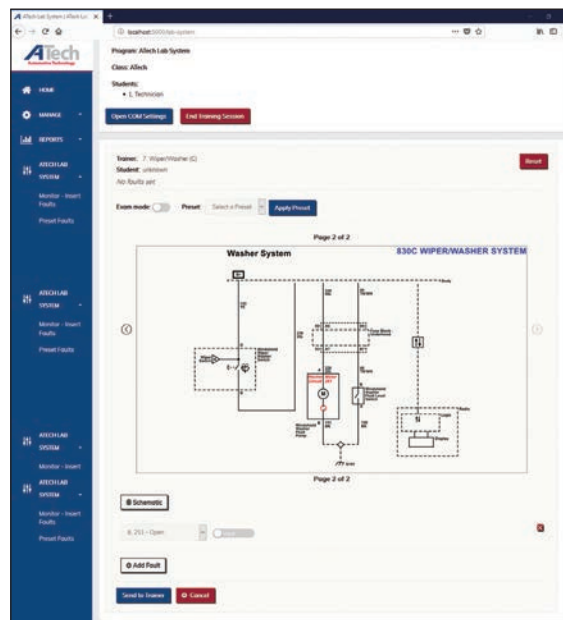
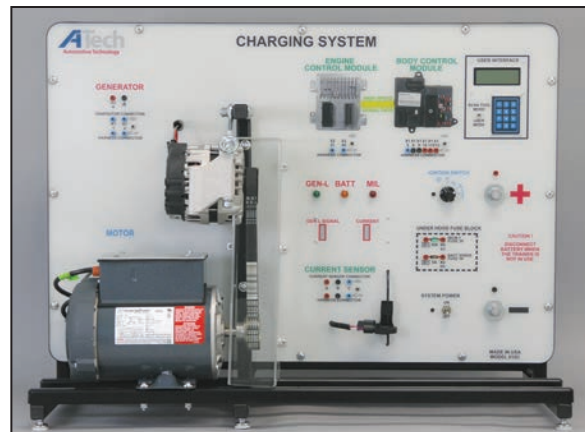
Atech 800 Series Trainers



Atech model 811C



Atech model 812C

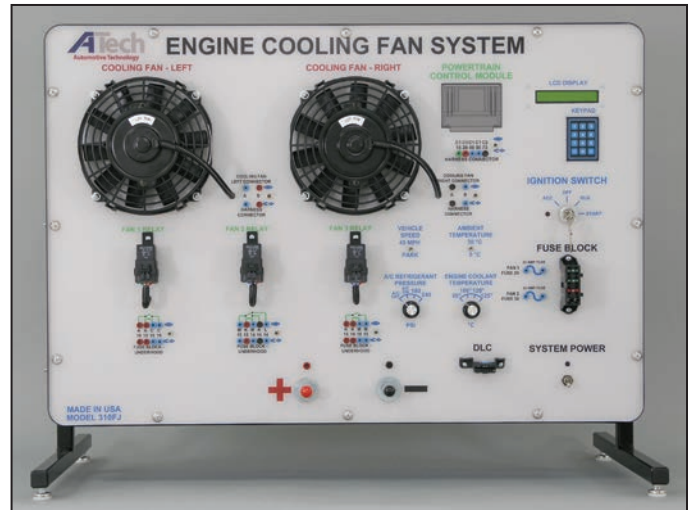
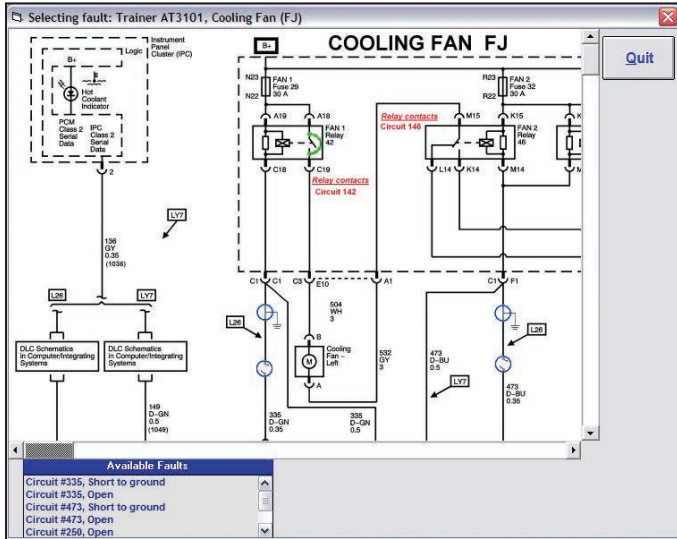


Atech model 830C

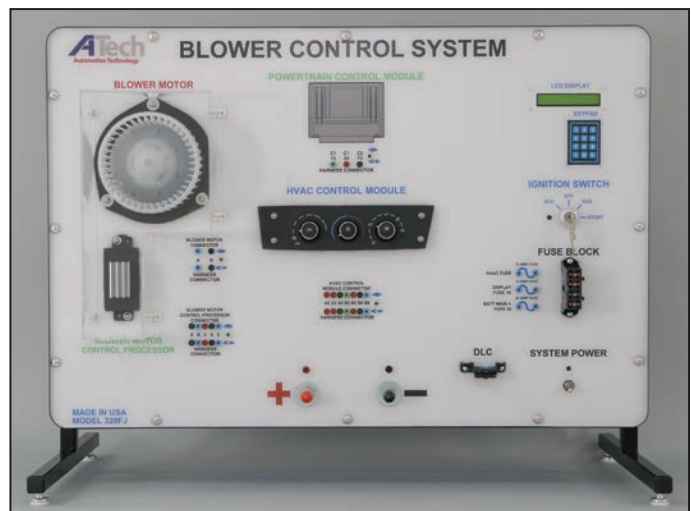
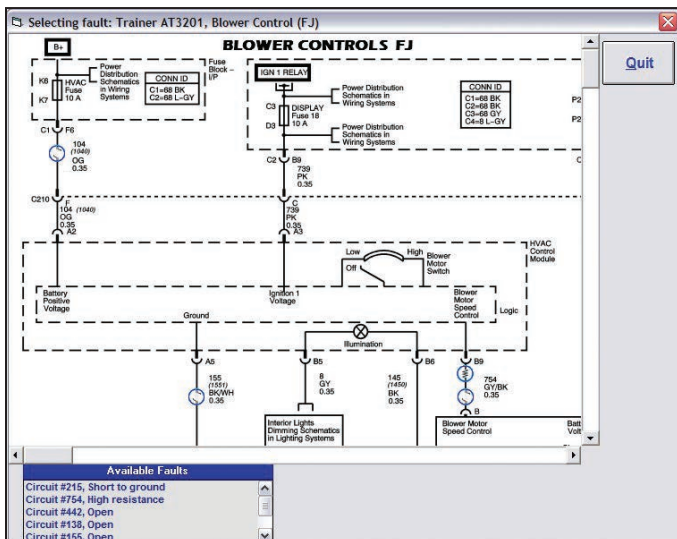
# Lab Integration

## Fault Insertion Screens Examples

### ATech 300 Series Trainers



ATech model 310FJ



ATech model 320FJ

# Lab Integration

## Fault Insertion Screens Examples

### ATech 3600 Series Trainers

MONITOR class ATECH.....

Class Name: **ATECH**

Program: **Engine Control Diagnostic Fundamentals AT3630 CBI**

**Quit Monitor**

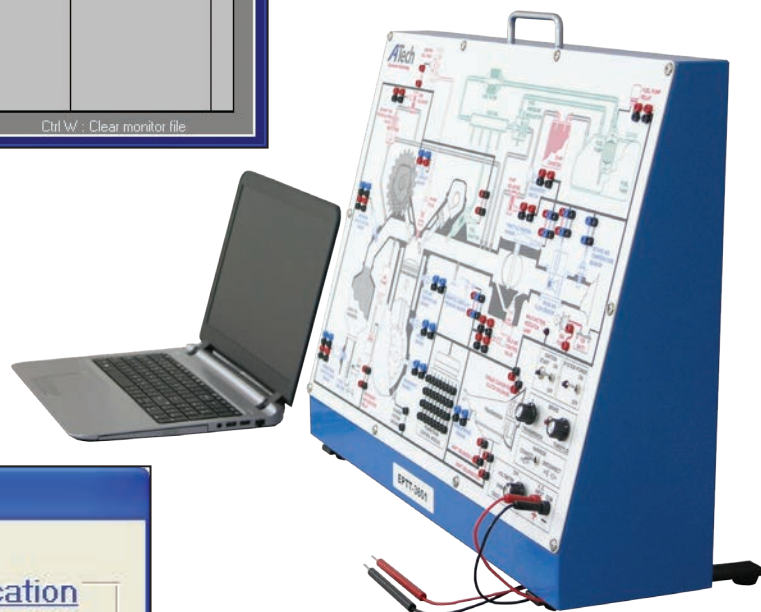
**Previous Faults** **Close** **Send Fault**

Student Name	Activity	Circ.#	Student answer	Correct answer	Last report	C/I
1, Tech	Exam 1	FuelPun		sply conn open	7-23-2009, 10:34 AM	
2, Tech	Send flt 1	FuelPun		sply conn open	7-23-2009, 10:34 AM	

Ctrl W - Clear monitor file

Fault Monitoring Screen

ATech model 3601



Fault Insertion Screen for 3630

Insert fault AT3630

Student name: **Tech 1**

Student ID: **111-11-1111**

**Circuit**

- ☐ Fuel Pump
- ☐ ECT sensor
- ☐ Injector
- ☐ IAT sensor
- ☒ TP sensor

**Fault type**

- ☐ Open
- ☐ High resistance
- ☒ Short to ground
- ☐ Short to voltage
- ☐ Shorted

**Fault Location**

- ☐ Supply wire
- ☐ Supply connector
- ☐ TP sensor
- ☐ Signal connector
- ☒ Signal wire
- ☐ Return connector
- ☐ Return wire

**Add to List** **Remove from List** **Cancel** **Send Fault** **Send fault to all**

Fuel Pump, Open, Supply connector  
ECT sensor, High resistance, Signal connector  
Injector, Open, Injector coil

# Lab Integration

## Fault Insertion Screens Examples

### ATech 1800 Series Trainers

- View Records

Class: **ATECH** ID: **111-11-1111** Password: **pass**

Name: **1. Tech**

Alt.F1 for help

Date	Time	Circuit	Fault given	Student's answer	C/I
7/23/2009	10:01 AM	TP sensor	sig. wire shrt to grnd	sig. conn shrt to grnd	I
7/23/2009	10:00 AM	Injector	inj. coil open	inj. coil open	C
7/23/2009	9:59 AM	ECT sensor	sig. conn high resis.	sig. conn high resis.	C
7/23/2009	9:59 AM	Fuel Pump	sply conn open	sply conn open	C

1800 Series



Diagnostic Record Screen

Fault Insertion Screen for 1810

AT1810, Select Faults to send

Activity Number

- 3, Electrical faults. Troubleshoot
- 4, Ohm's Law. Parallel circuit
- 5, Relay & circuit. Test light
- 6, Horn circuit. Relay #2, Jumper
- 7, Switches. Breaker. Short finder
- 8, Tail & Brake Light Circuit
- 9, Starter Motor circuit
- 10, Turn Signal Circuit
- 11, Ignition Key Warning circuit
- 12, Electric Cooling Fan circuit

Available Faults

- "13", Cmp #4, High Resistance
- "26", Cmp #7, Short to Ground
- "03", Cmp #18, High Resistance
- "02", Cmp #18, Open Circuit

Faults selected to send

- "10", Cmp #3, Open Circuit

Select Activity number then select faults to send.  
Click <Send Fault> when done.  
Maximum number of faults can be sent is five.

ATech Training, Inc

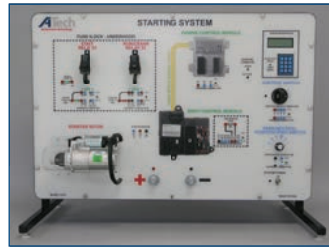
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# Next Generation "Smarter Car"



Power Door Lock System  
Model 850C



Starting System  
Model 811C



Charging System  
Model 812C



Wiper/Washer System  
Model 830C



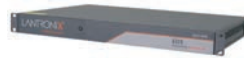
Lighting System  
Model 821C



Power Window System  
Model 840C\*



Keypad/Display  
Interface



Atech Lab System (ALS)



Instructor's Computer



Power Seat System  
model 860C\*

Atech's Next Generation "Smarter Car" configuration simultaneously allows a class of students to study and troubleshoot separate electrical / electronic systems.

## Features:

- Courseware includes: Instructor Guide, Student Manual, and Service Information
- Actual new vehicle components
- Insert hard faults using the built-in keypad
- Insert intermittent or hard faults using computer or Atech Lab System (ALS)
- Compatible with Instructor's Management Program (IMP)
- Built-in scan tool (\*not applicable)
- Requires 12V battery (Starting System and Charging System require a 12VDC battery) or power supply (power supply can be purchased as an option)

# STEM Activity

Gears are one of the building blocks for many STEM paths.



# Hands-On

Engaging students in the learning process creates a higher knowledge transfer.



## What is included:

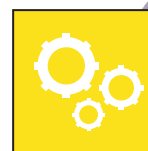
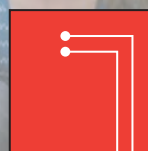
- 3 Cars
- Gears
- 3 Controllers
- 3 Stopwatches
- Batteries
- Activity Sheet
- Record Sheet
- Tape

## Recruit Students

Market to potential students for your program through earlier contact opportunities.



# STEM



Science • Technology • Engineering • Math

## Activity Recruitment

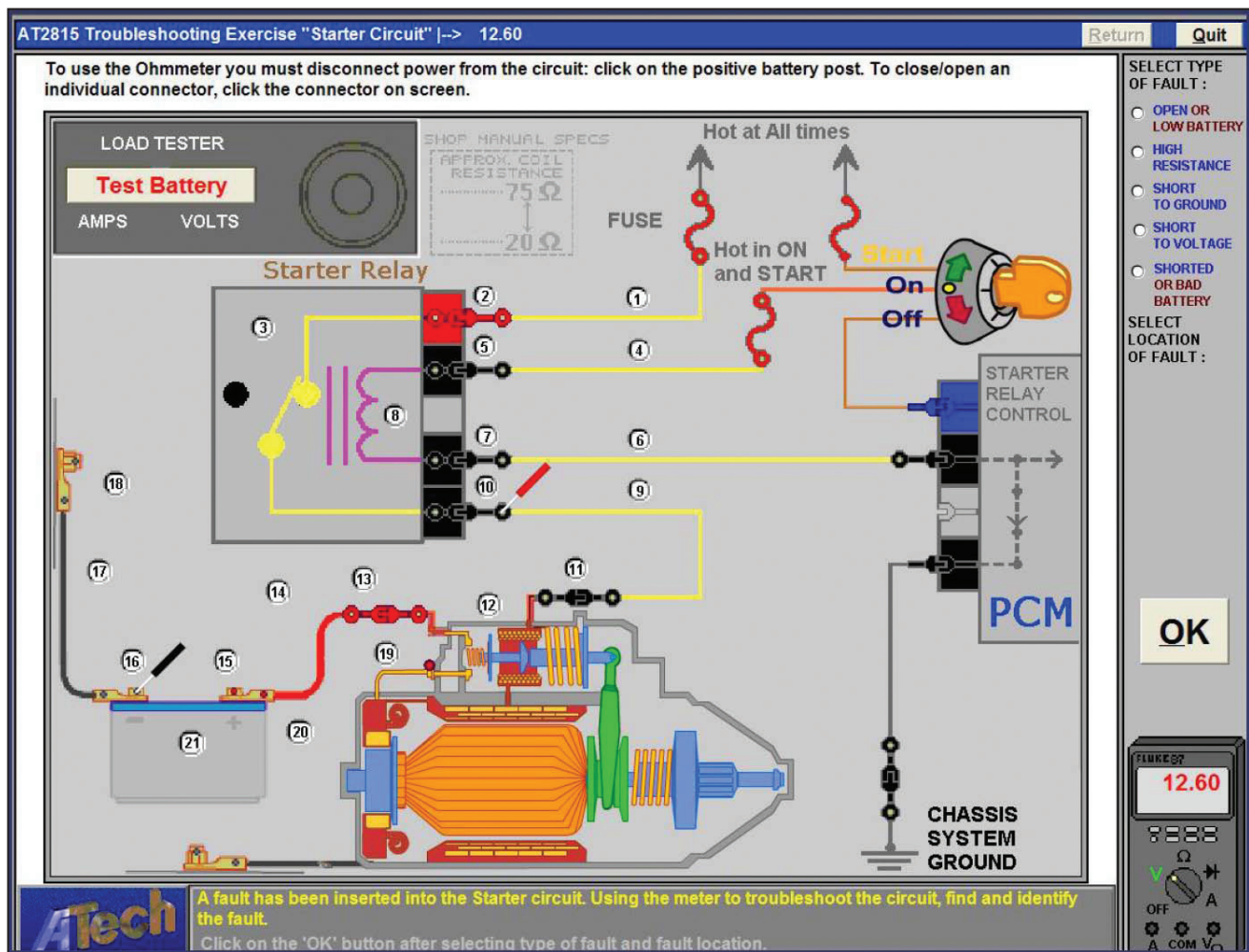
by

# Atech

Automotive Technology

Walton, KY

# Computer-Based Instruction



## Starter System Troubleshooting - model 2815

The Starter System Troubleshooting Trainer is a software program based on a starting system and presents the basic concepts of troubleshooting starter system components. This program can operate in random mode when the faults are selected randomly for each circuit chosen, or the instructor can select faults from various circuits to be activated as each student runs the program.

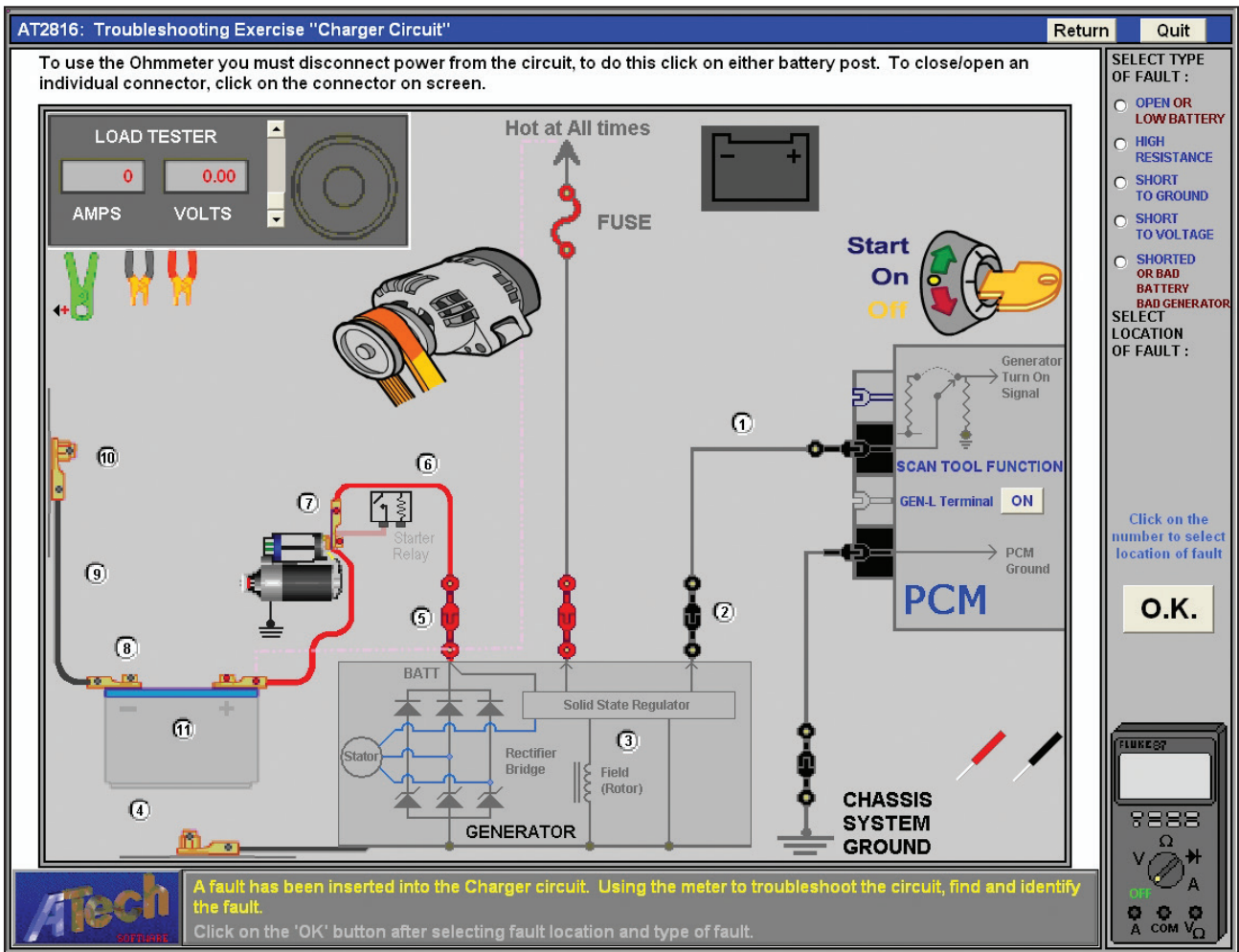
### Features:

- Types of troubleshooting faults: Open Circuit, High Resistance, Short to Ground, Short to Voltage, and Shorted Component
- Built-in DVOM and load tester
- Voltage and resistance measurements
- Visual reinforcement of circuit behavior
- The Instructor's Management Program (IMP) is used in conjunction with the starter system software to monitor student progress, view student responses, and insert faults
- Network Version Available – model 2815N

### Activities Include:

- Troubleshooting section that can insert 47 possible faults into starting circuits for diagnosis in Training or Advanced Mode.

# Computer-Based Instruction



## Charging System Troubleshooting- model 2816

The Charging System Troubleshooting Trainer is a software program based on a charging system and presents the basic concepts of troubleshooting charging system components. This program can operate in random mode when the faults are selected randomly for each circuit chosen, or the instructor can select faults from various circuits to be activated as each student runs the program.

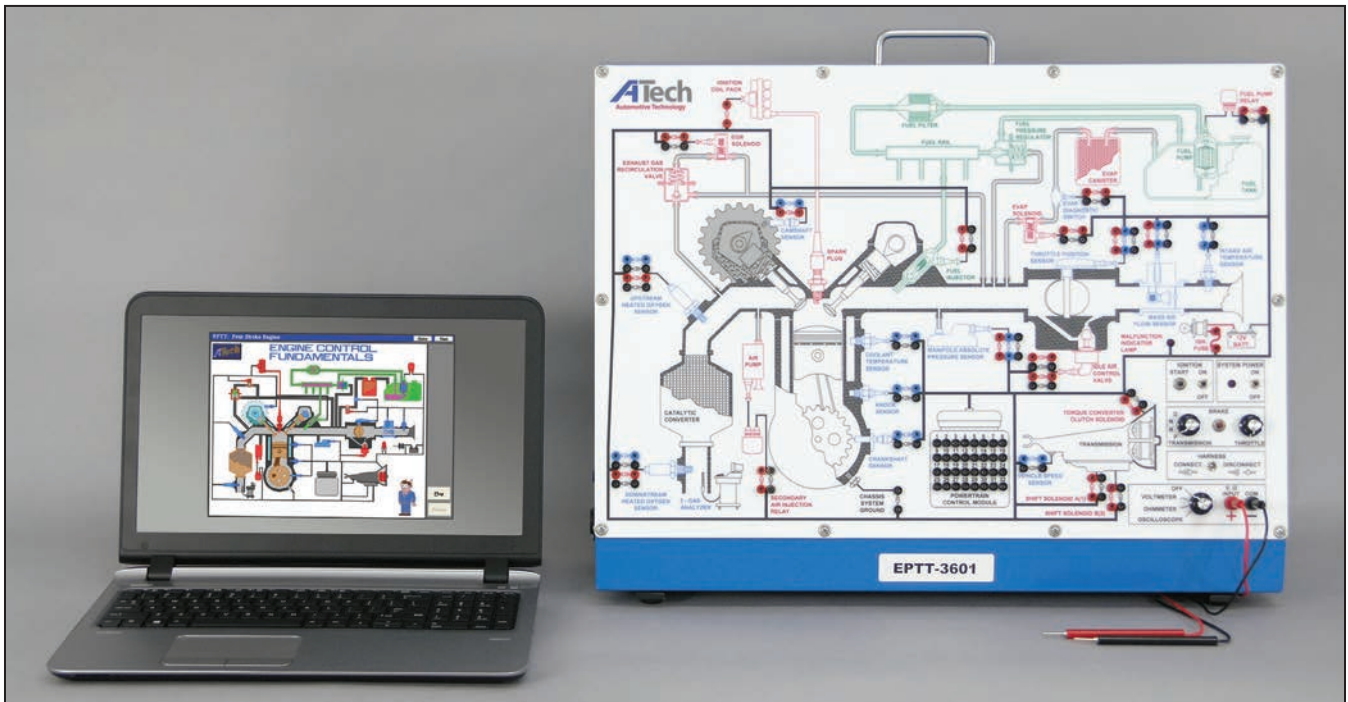
### Features:

- Types of troubleshooting faults: Open Circuit, High Resistance, Short to Ground, Short to Voltage, and Shorted Component
- Built-in DVOM and load tester
- Voltage and resistance measurements
- Visual reinforcement of circuit behavior
- The Instructor's Management Program (IMP) is used in conjunction with the charging system software to monitor student progress, view student responses, and insert faults
- Network Version Available – model 2816N

### Activities Include:

- Troubleshooting section that can insert 19 possible faults into charging circuits for diagnosis in Training or Advanced Mode.

# Computer-Based Instruction

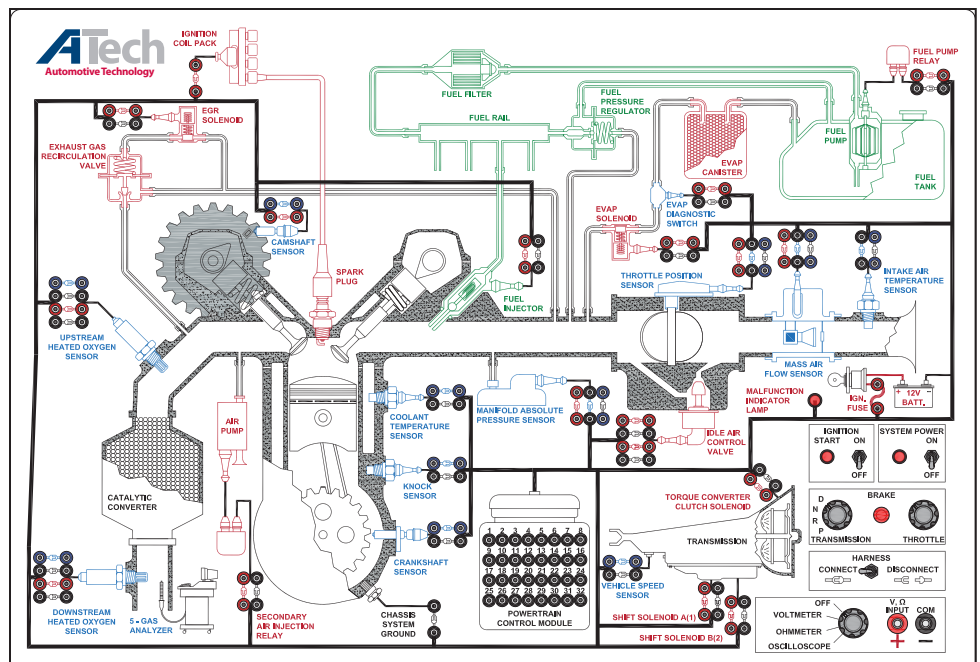


## Computer-Based Programs

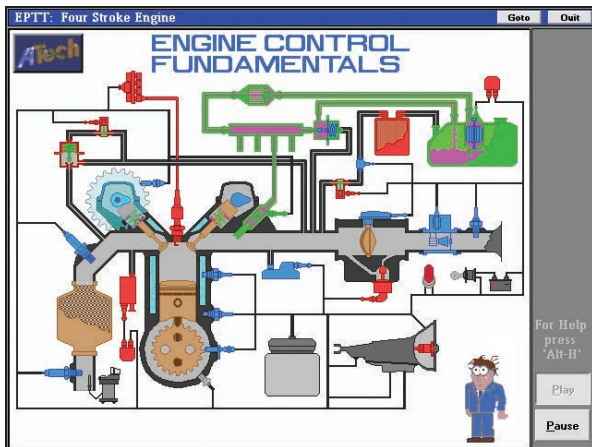
The #1 provider of Engine Performance Trainers offers computer-based simulation. ATech's automotive fundamental programs harness the power of computers to enhance the learning experience with animations of important concepts. Hands-on activities provide need-to-know reinforcement while computer-controlled diagnosis provides troubleshooting practice and competency testing. Keeps students highly motivated.

## Engine Performance Troubleshooting Trainer model 3601

The automotive fundamental programs include the Engine Performance Troubleshooting Trainer (model 3601). This platform will support models 3610, 3620 and 3630 computer-based courses and provides students with hands-on reinforcement.



# Computer-Based Instruction

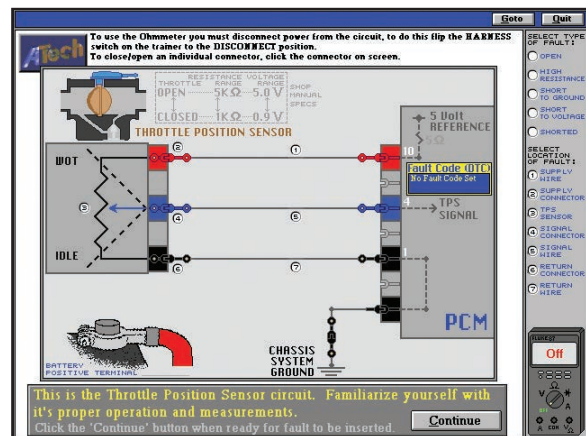
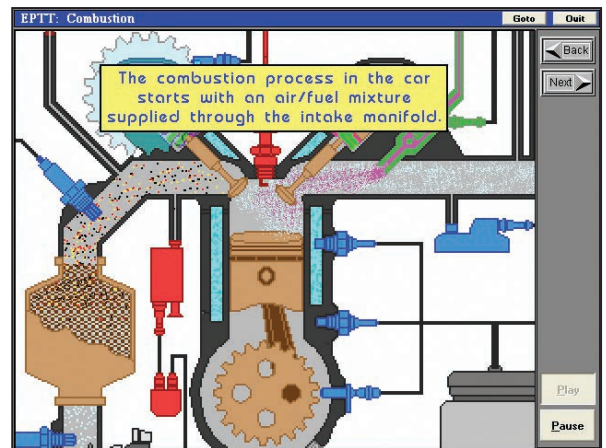


## Engine Control Fundamentals model 3610

This program consists of 21 student activities with more than 60 animations designed to present the fundamentals of engine control components. Includes hands-on digital voltmeter and ohmmeter use.

## Engine Control Systems Operation model 3620

This program consists of 14 student activities with more than 60 animations designed to present closed loop emission control systems. Includes hands-on voltmeter and oscilloscope usage.



## Engine Control Diagnostic Fundamentals model 3630

This program consists of 16 student activities with more than 45 animations. Includes five automotive circuits to troubleshoot (Fuel Pump Relay, ECT, Fuel Injector, IAT, & TPS) with more than 60 faults. Includes instructor fault insertion capabilities.

## Student Record Keeping

All programs provide student record keeping. Each student is assigned a student identification (ID) number and password. The student's performance is recorded in their file as the student proceeds through the program.

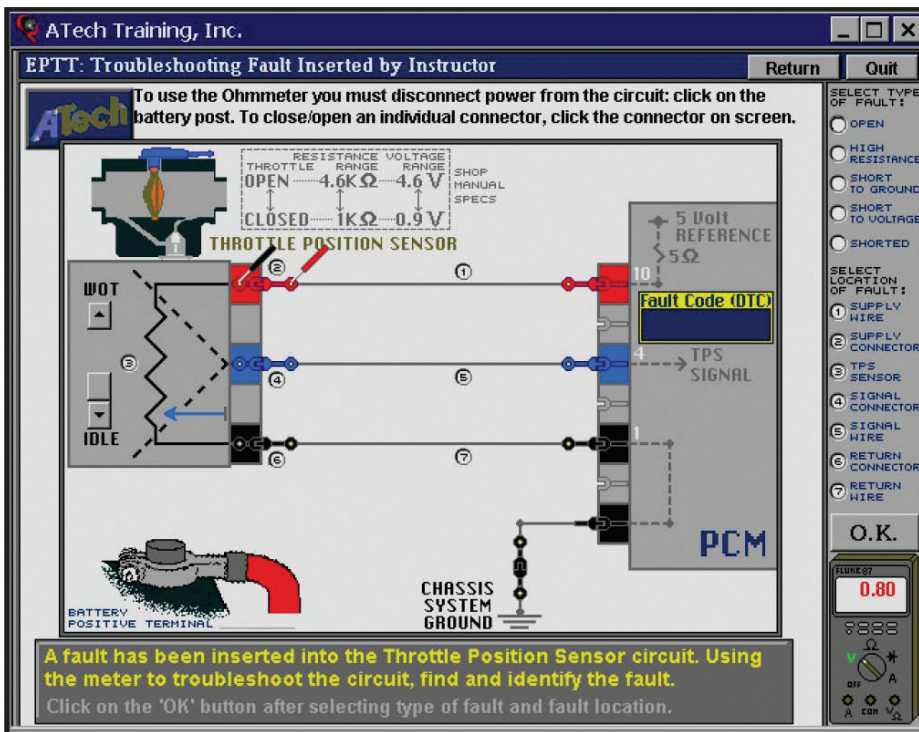
## Classroom Management

Each program includes an Instructor's Management Program (IMP). With menu selections from the IMP, the student USB drive is prepared and records can be accumulated and transferred to the instructor's computer. Centralized storage of student records over a Microsoft™ network is also available. Program includes remote fault insertion capability. Remote faulting can't be used when using a student USB.



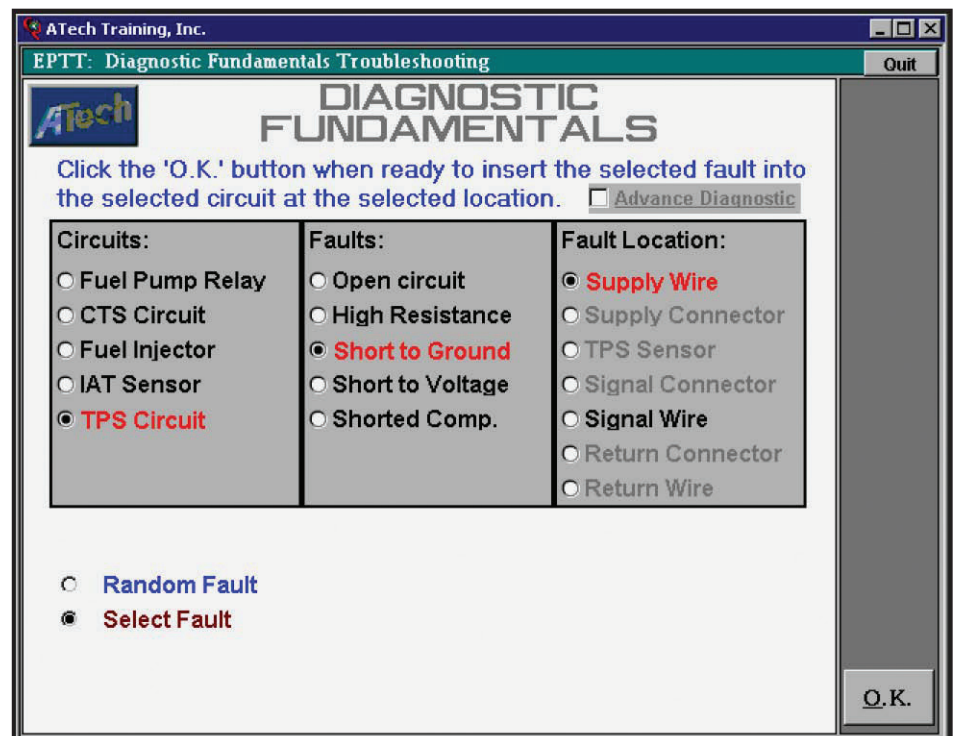
# Computer-Based Instruction

## Computer-Based Troubleshooting Skill Development ATech 3631



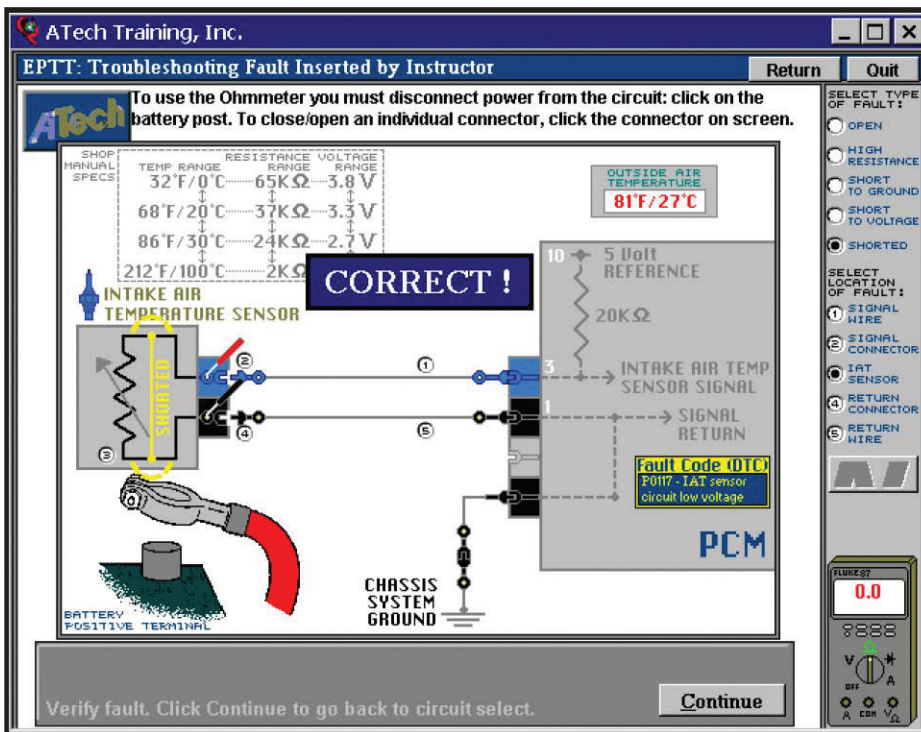
- Independent student practice
  - no instructor intervention required
- Selection from one of five circuits for troubleshooting:
  - Throttle Position Sensor
  - Fuel Pump and Relay
  - Fuel Injector
  - Engine Coolant Temperature Sensor
  - Intake Air Temperature Sensor
- Instructor can select circuit, fault type, and location
- Computer-controlled automatic fault insertion and random fault mode
- Network Version Available - model 3631N

- More than 60 real-world faults
- Multiple fault types:
  - Opens in Wires and Connectors
  - High Resistance in Wires and Connectors
  - Short to Voltage
  - Short to Ground
  - Open Components
  - Shorted Components
- Highly interactive:
  - TPS circuit illustrates mechanical throttle valve operation
  - Click to disconnect battery
  - Slider adjusts TPS position



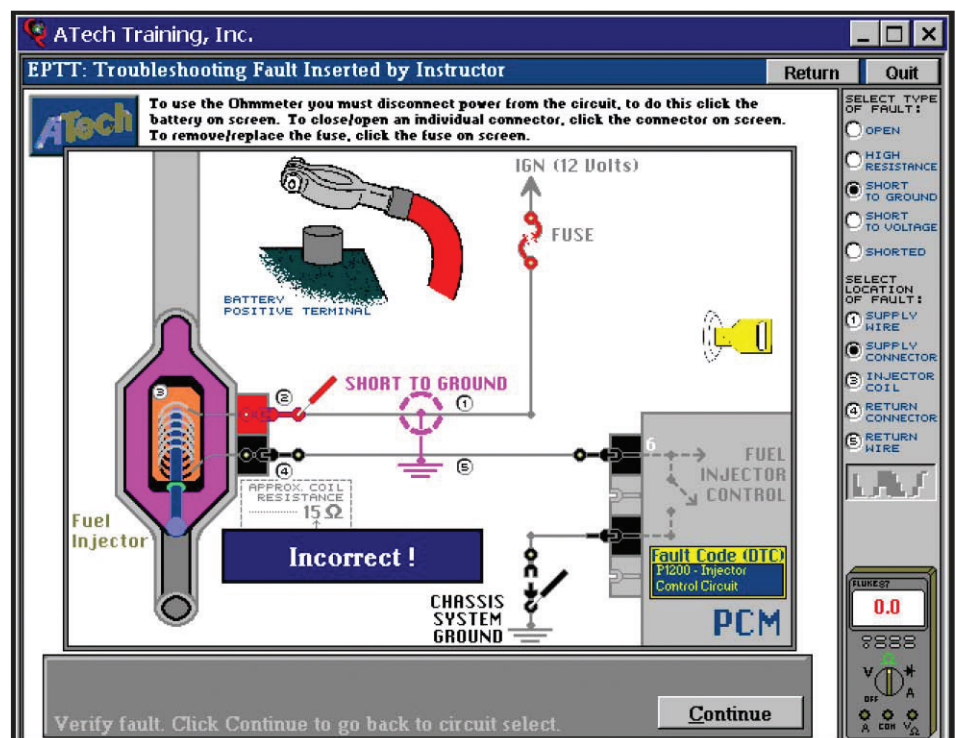
# Computer-Based Instruction

## Computer-Based Troubleshooting Skill Development ATech 3631



- Service manual specifications included on screen
- Temperature resistance relationships displayed on screen
- Built-in digital multimeter with interactive probes
- Real-world DTCs shown on scan tool readout screen
- Ohmmeter prompt given to disconnect circuit power
- Connectors can be disconnected
- Fuse can be removed and ground disconnected

- No repeated faults until all circuit faults have been initially completed
- Short-to-ground faults can blow fuses
- Two skill levels included:
  - Training Mode
  - Advanced Mode
- Training Mode allows measurement across connector pins
- Advanced Mode only allows back probing of connectors
- Probes automatically moved from disallowed connection points in Advanced Mode



# Computer-Based Instruction

*ATech's Electricity and Electronic Programs are Computer-Based Instruction.*



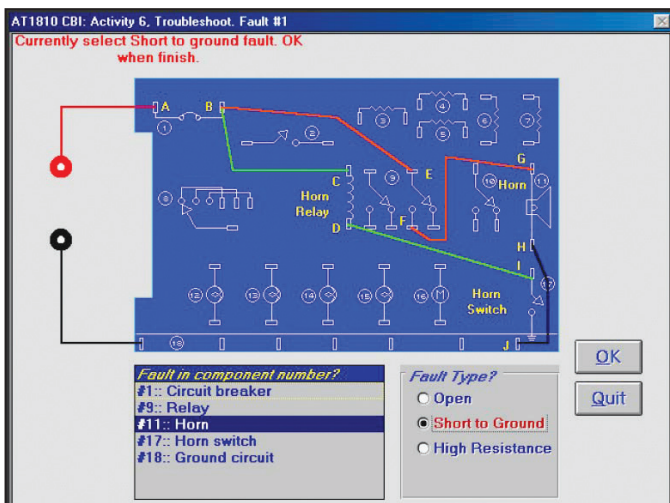
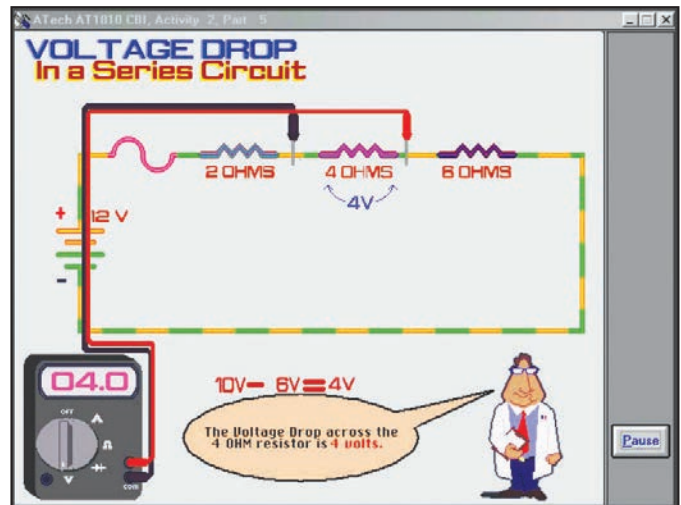
The gold standard in trainers, ATech continues to develop innovative computer-based simulation programs.

ATech's automotive fundamentals programs have harnessed the power of computers to enhance the learning experiences with animations of important concepts.

Hands-on activities provide need-to-know reinforcement while computer-controlled diagnosis provides troubleshooting practice and competency testing.

Holds student interest and encourages participation.

- Automotive Electricity Computer-Based Instruction (CBI) Software (model 1810W)
- Automotive Electronics Computer-Based Instruction (CBI) Software (model 1820W)



- Provides troubleshooting practice and competency testing
- Classroom management with remote fault insertion capability
- Student record keeping with print outs

# Electrical / Electronic Systems



ATech's Electricity and Electronics programs include four hands-on courses developed specifically for automotive / auto body / truck students and technicians. These courses require ATech's Troubleshooting Trainer (model 1801B).

*"...Automotive Electricity/Electronics is a difficult subject for high school students...We've found that ATech trainers, with their hands-on approach, have kept the students on task for longer periods of time without getting bored. We're looking forward to a greater percentage of our students mastering electrical / electronic tasks through use of the ATech system."*

*Cape Cod Regional Technical High School*

## Program Courses:

- Automotive Need-to-Know Courses:
  - Automotive Electricity - model 1810A
  - Automotive Electronics - model 1820A
- Automotive Technician Courses:
  - Automotive Sensors and Actuators - model 1830
  - Automotive Computer Concepts - model 1840 (requires 1802 Keypad)

*"...thank you for your company's participation in the development of the Automotive Electronics Course hardware and workstation exercises. Your company has met and exceeded our expectations in terms of quality, timing and confidentiality on all accounts."*

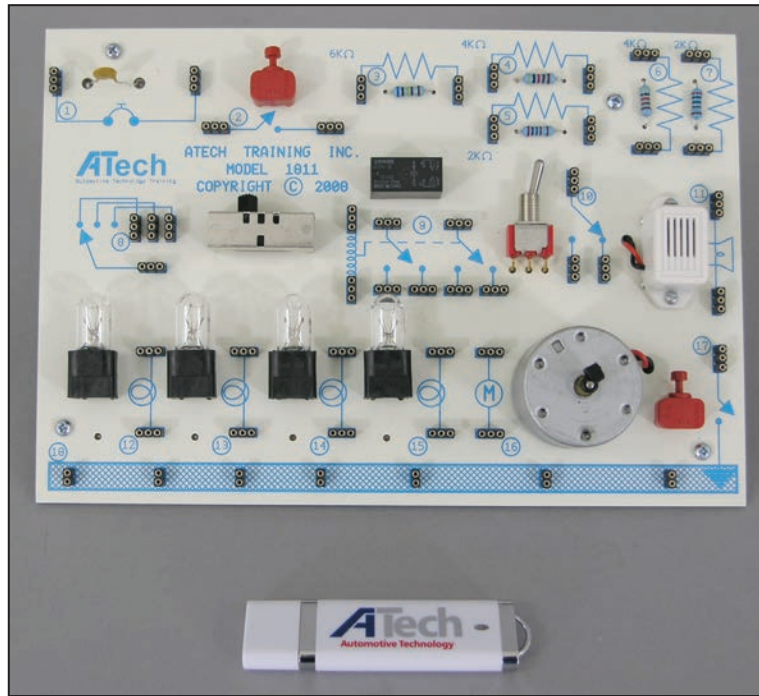
Tech Training Program Manager,  
Ford Customer Service

## Program Features:

- Used by Bosch, Ford, Chrysler, Nissan in U.S., Canada, Mexico, China, Brazil, Taiwan, Australia, Chile, Vietnam, Saudi Arabia, and Kuwait
- Used by hundreds of public and private schools since 1986
- Includes On-Trainer, Troubleshooting and In-Shop Worksheets
- A proven product for more than 30 years
- Modular Design - easy updating
  - Optional Fault Board - model 1800FB (installed in trainer)
  - Interactive Keypad - model 1802
  - Computer-Based Instruction models 1810W and 1820W (see page 23)

# Electrical / Electronic Systems

## Automotive Electricity Courseboard model 1811



The Automotive Electricity Courseboard (model 1811) is a hands-on study of basic automotive electricity that includes a Courseboard and USB drive containing the Student Manual and Instructor Guide. Also included with the courseware package is an on-site copy license to allow for the reproduction of instructional materials for use in the classroom.

The Automotive Electricity Courseboard features real fixed components and wire terminals. 12-volt power supply not included. Does not include fault insertion capability.

### Activities Include:

#### **UNIT I** - Introduction to Electricity

- Series Circuit - Use of Voltmeter
- Parallel Circuit - Use of Ammeter
- Series-Parallel Circuits - Use of Ohmmeter

#### **UNIT II** - Electrical Behavior

- Series Circuits 1, 2, 3, and 4
- Parallel Circuits 1, 2, 3, and 4
- Series-Parallel Circuits 1, 2, and 3

#### **UNIT III** - Use of Troubleshooting Equipment / Automotive Circuits

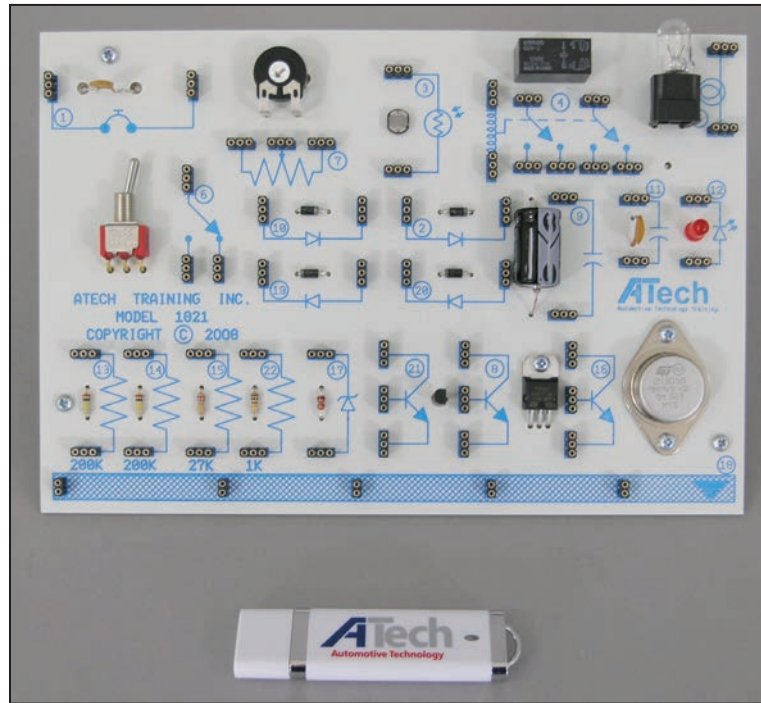
- Trunk Release Circuit
- Horn Circuit
- Back-Up Lamp Circuit
- Tail Light & Brake Light Circuits
- Starter Motor Circuit
- Turn Signal Circuit

#### **UNIT IV** - Use of Service Manual Schematics / Automotive Circuits

- Ignition Key Warning Circuit
- Electric Cooling Fan Circuit
- Brake Warning Circuit
- Heater Blower Circuit
- Headlight Circuit
- Dome Light Circuit

# Electrical / Electronic Systems

## Automotive Electronics Courseboard model 1821



The Automotive Electronics Courseboard (model 1821) is a hands-on study of basic automotive electronics that includes a Courseboard and USB drive containing the Student Manual and Instructor Guide. Also included in this courseware package is an on-site copy license to allow for the reproduction of instructional materials for use in the classroom.

The Automotive Electronics Courseboard features real fixed components and wire terminals. 12-volt power supply not included. Does not include fault insertion capability.

### Activities Include:

#### **UNIT I** - Introduction to Electronics

- Electricity to Electronics
- The Digital Multi-Meter
- Why use a DMM?

#### **UNIT II** - Introduction to Semiconductors / Diodes

- Diode Behavior
- The Diode as a Rectifier
- The Light Emitting Diode (LED)
- The Clamping Diode
- The Zener Diode

#### **UNIT III** - Transistor Circuits

- The Transistor Circuit
- The Amplifier
- Transistor Troubleshooting
- Combining Transistors

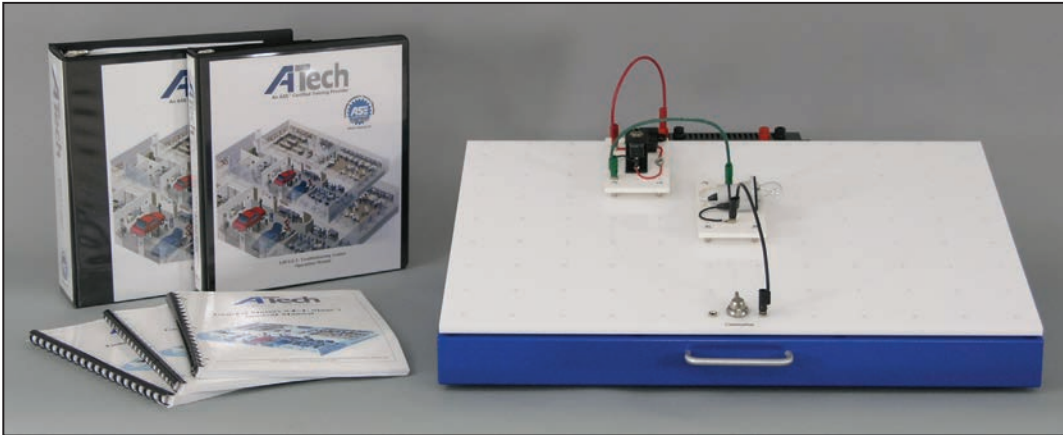
#### **UNIT IV** - More Electronics

- The Capacitor
- The Photo Resistor
- Combined Electronics

# Electrical / Electronic Systems

## "Factory Training Programs"

ATech was involved with the design and manufacturing of the electricity and electronic trainers currently used by General Motors, Chrysler, Ford, Nissan, Bosch, Honda and Volkswagen.



### GM Specialized Electronic Training (S.E.T.) Program model 18002TR

- The most widely used "OEM" Training System in the world
- Hardware design by ATech Training, Inc.
- Used by GM Training Centers and ASEP Schools
- Special configurations for John Deere, Caterpillar, Honda and VW
- Selected vehicle components
- 12-Volt and 5-Volt DC power supplies included
- 12-Volt AC power supply included
- Complete "Factory" Courseware available
  - Instructor Guide - model 18002IG
  - Student Workbook - model 18002SM

*"I'm impressed with ATech's superior dedication to quality training. It clearly shows in both product design and customer service. General Motors is pleased!"*

*GM Service  
Technology Group*

*"This is the best automotive electronics training program anywhere!"*

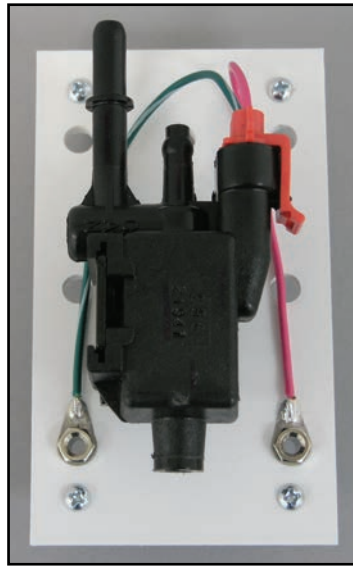
*Automotive Technology Instructor  
Wheeling High School  
Wheeling, IL*

# Electrical / Electronic Systems

## Optional Submounts



Fuel Injector  
500-008-001



EVAP Purge Valve  
500-008-002



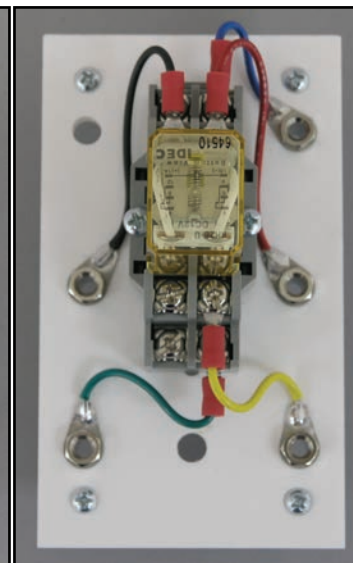
Small Motor  
500-008-003



Positive Thermal  
Coefficient Resistor  
500-008-004



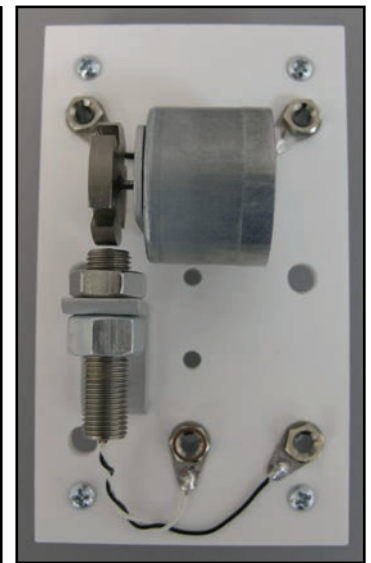
Negative Thermal  
Coefficient Resistor  
500-008-005



Clear Case Relay  
and Socket  
500-008-006



Double Pole Double  
Throw Switch DPDT  
500-008-007



Variable Reluctor Sensor  
500-008-008



Pulse Width Modulation Controller  
500-008-009

# Electrical / Electronic Systems



## GM S.E.T. Troubleshooting Trainer model 18002TT

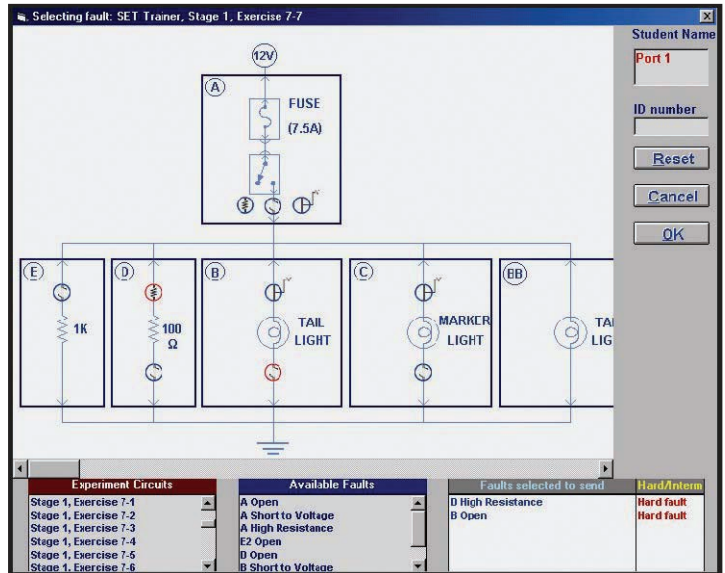
### Covers General Motors S.E.T. Electrical/Electronics Stage 1, 2, and 3:

- Provided in locking suitcase for security and portability
- Includes components for all three stages and original GM "faulted" components
- Local and network fault insertion
- Fault insertion selection by exercise number, "Example 3-2"
- Fault insertion selection by module
- Instructor can develop circuits and faults at component level
- Network display and storage of student's performance
- Compatible with ATech Lab System (ALS) and Instructor's Management Program (IMP)

# Electrical / Electronic Systems

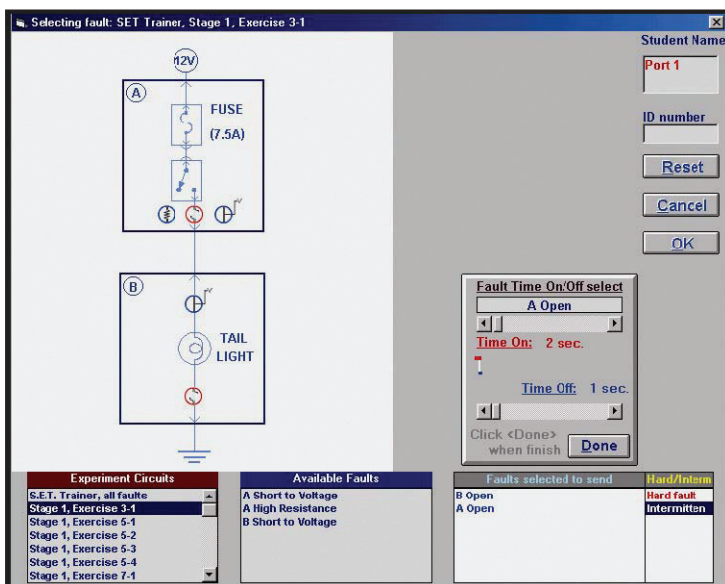
## GM S.E.T. Troubleshooting Trainer Continued

- Quick setup for on-the-road training
- Fault insertion in individual or all student stations from instructor's computer
- Up to 5 faults can be preselected for insertion
- Preselected faults will automatically be inserted in order of selection (when student completes one, next one is given)
- Instructor's computer displays student's answer, correct answer and stores results in student file



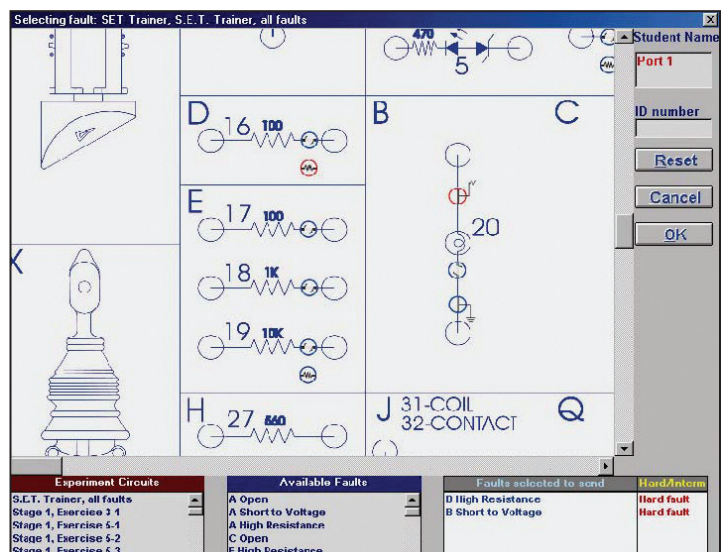
### Fault Selection by S.E.T. Exercise Number

- ATech's copyrighted "Schematic Based Fault Insertion"
- Fault Selection from list or schematic indicator
- On-screen indication of selected faults



### Intermittent Fault Time Adjustment

- Intermittent fault "On" and "Off" time adjustments
- "Build Your Own Circuit" capability - Instructor can select from all faults
- Troubleshooting practice or exam mode capability
- Student results are saved in student file



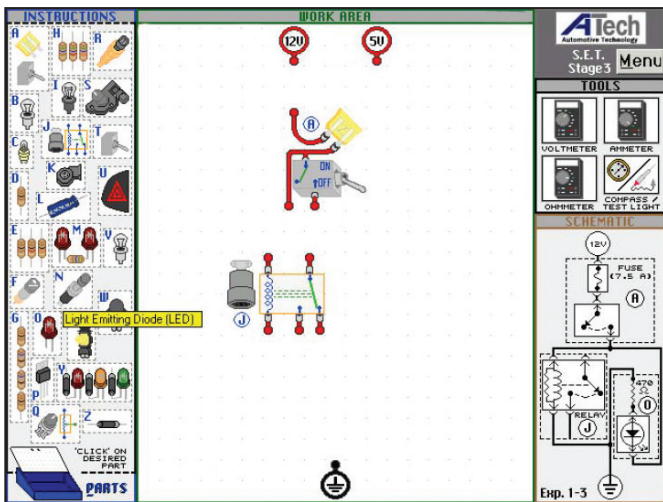
### "Build Your Own Circuit" Fault Selection

# Electrical / Electronic Systems

## GM S.E.T. Virtual Trainer

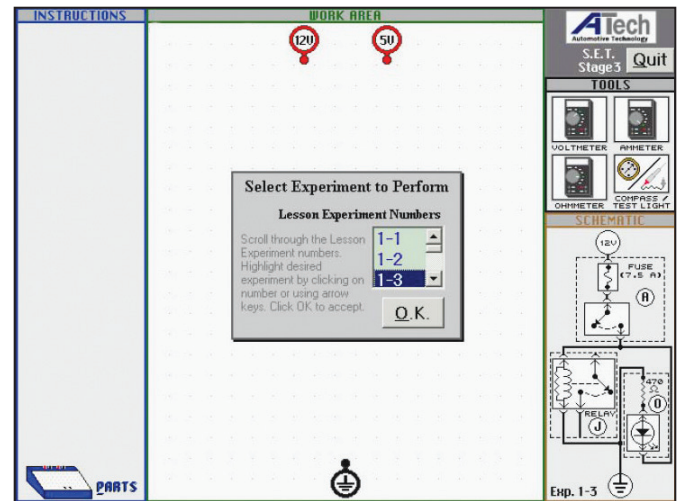
This ATech software is a low-cost complement / alternative to the GM S.E.T. project board. The program provides a virtual simulation of the GM S.E.T. Trainer and the instructional resources to perform the experiments from the GM Electrical / Electronics Stage 1, Stage 2, and Stage 3 courses.

- Experiment circuit illustrated in schematic
- Operational schematic; i.e., switch operates on both pictorial circuit and schematic
- Operational schematic ties components to symbols



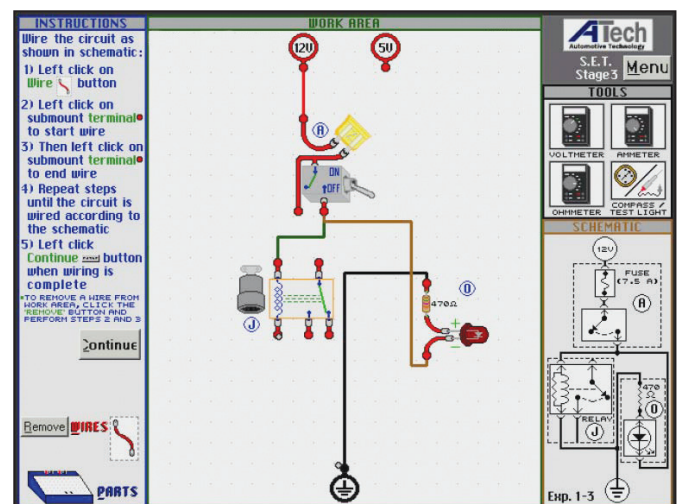
### Circuit Selection by Experiment Number

- Submount / component selection from pictorials and module numbers
- Submount / component interactive placement by selecting and dragging to position
- Software checks for accurate submount / component selection



### Submount Selection and Placement

- Interactive wiring of submounts
- Interactive relocation of wired submounts allows circuit reposition on breadboard
- Voltage measurements
- Resistance measurements
- Current measurements
- Simulated component operations

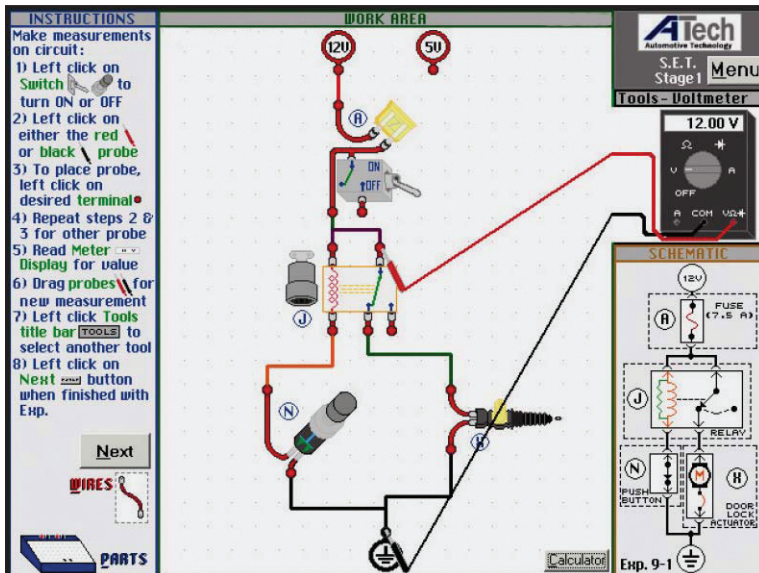


### Interactive Wiring

*"I'd like to express my gratitude for all the assistance that your organization has provided. We have successfully installed the GM Virtual Trainers in our Automotive Computer Lab. This, of course, could not have been possible without the assistance of your staff. Our instructors love the product and have begun developing lesson plans to utilize the software this semester. We have seen a dramatic increase in the knowledge retention of our auto students since implementing a computer lab with automotive based software, and we look forward to enhancing their learning process with your products. Again, thank you for all your assistance through this matter"*

Dept. of Information Technology  
Trident Technical College

# Electrical / Electronic Systems

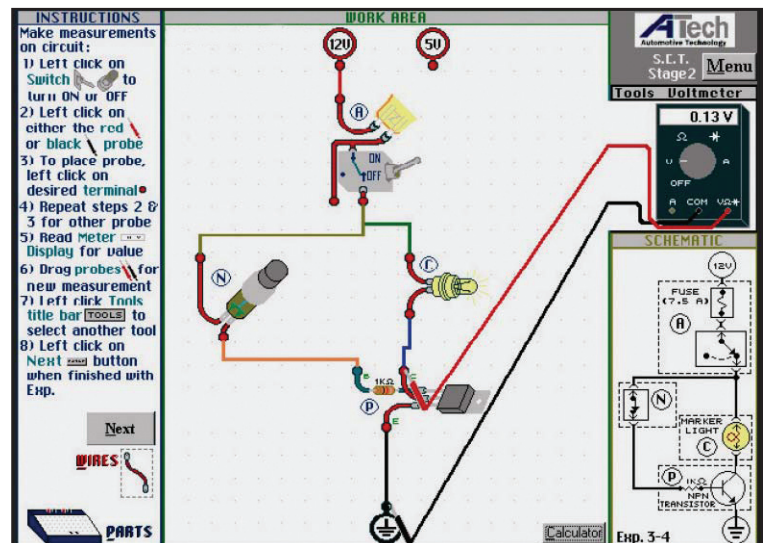


## GM S.E.T. Virtual Trainer - Stage 1 model 18002VT1

- Properties of Electricity
- Ohm's Law
- Series Circuits
- Parallel Circuits
- Series-Parallel Circuits
- Circuit Faults
- Electromagnetic Induction
- Network Version Available - model 18002VT1N

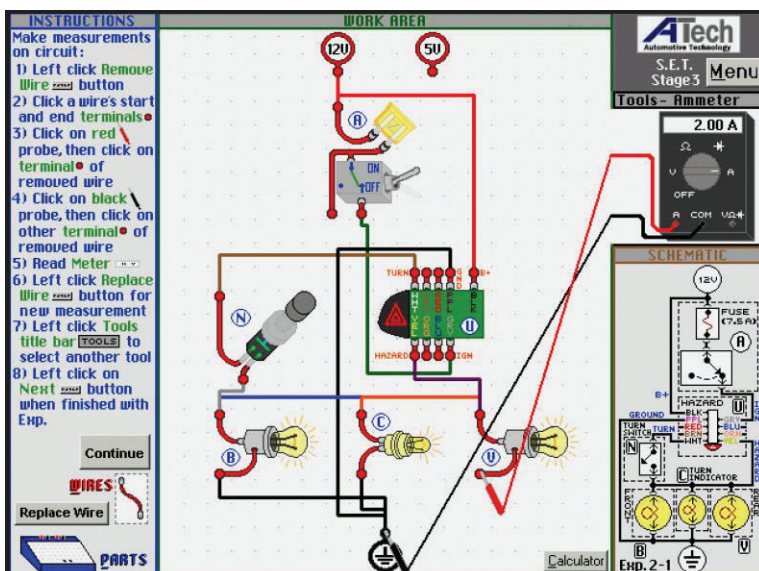
## GM S.E.T. Virtual Trainer - Stage 2 model 18002VT2

- Automotive Electrical Components
- Solid State Components
- Vehicle Systems
- Network Version Available - model 18002VT2N

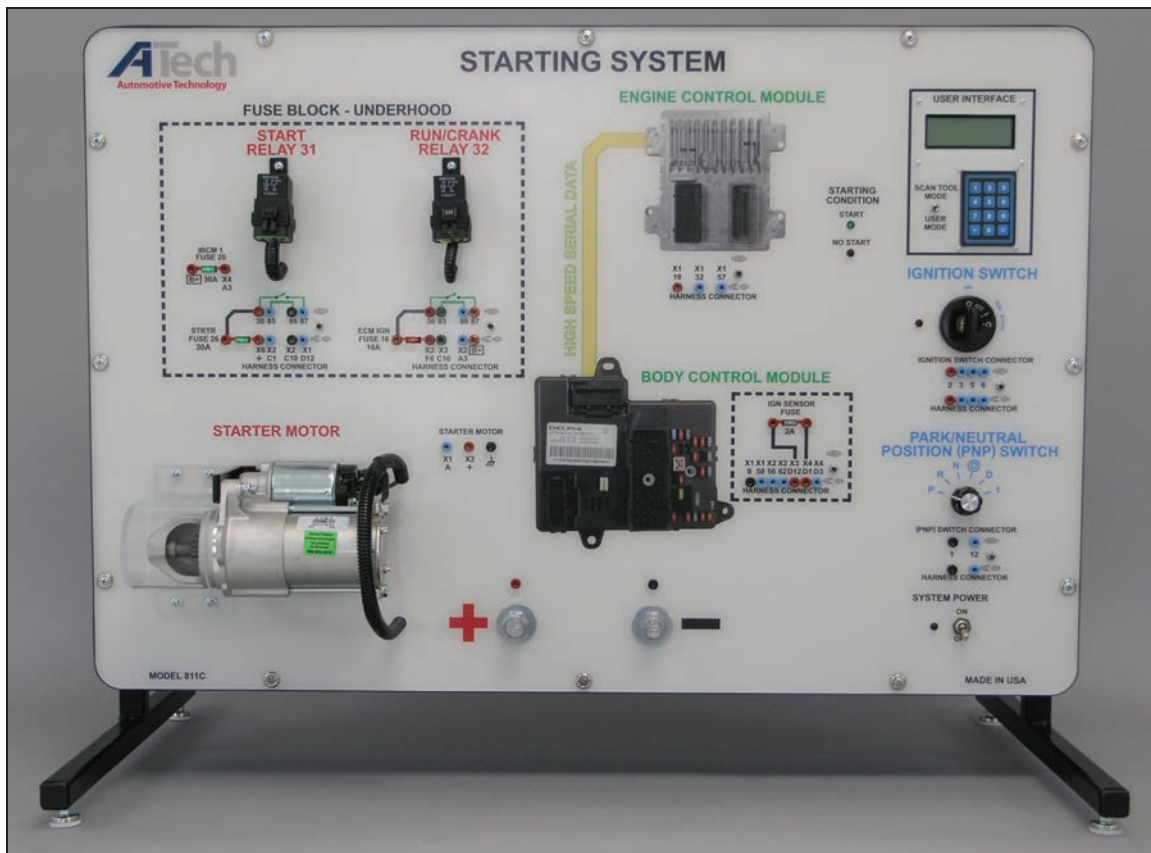


## GM S.E.T. Virtual Trainer - Stage 3 model 18002VT3

- Computers
- Sensor Inputs
- Actuator Outputs
- Series-Parallel Circuits
- Network Version Available - model 18002VT3N



# Electrical / Electronic Systems

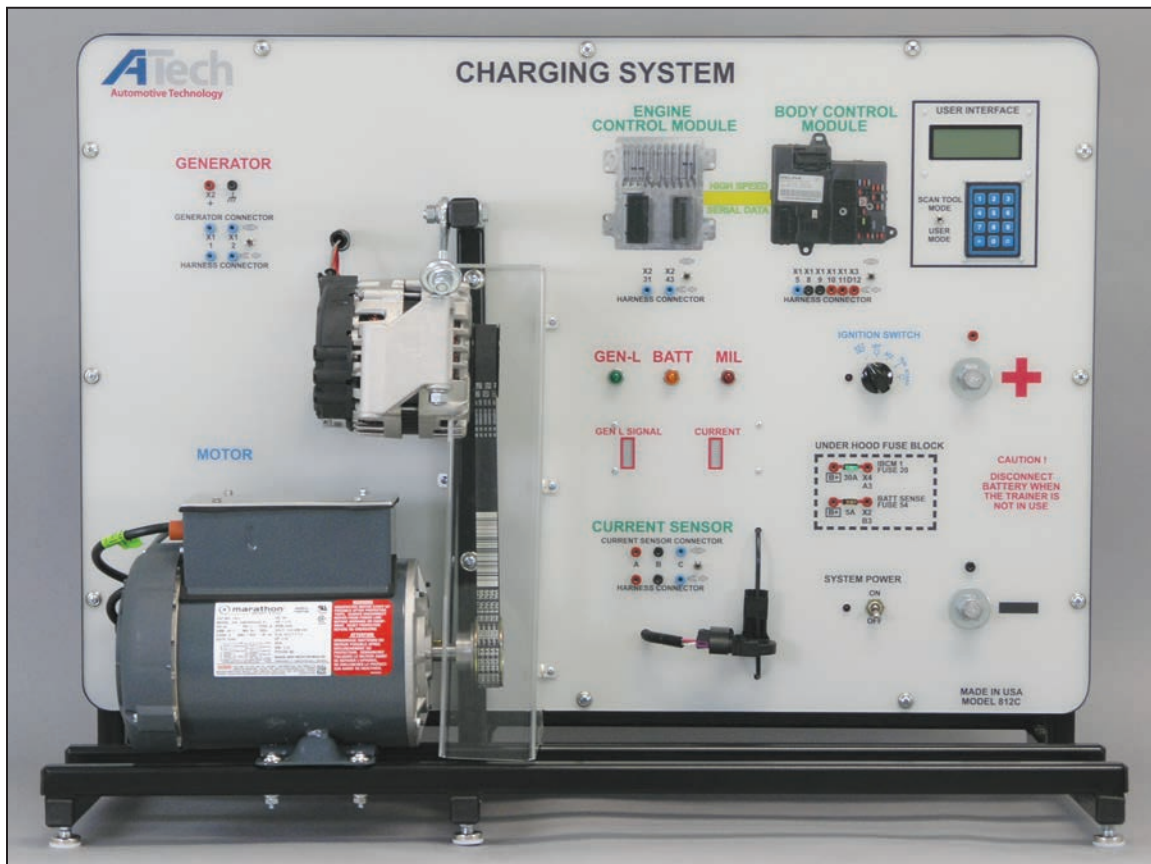


The ATech Starting System Trainer (model 811C) is part of an electrical system program which presents the live operation and study of starter motor systems. This trainer allows for instructor demonstration, student hands-on reinforcement, and troubleshooting practice. Powered by a 12VDC automotive battery (not included). The Starting System is based on a CAN platform vehicle.

## Features:

- New vehicle components, connectors, and factory wire colors
- Provides an advanced level of instruction by duplicating actual on-vehicle troubleshooting procedures
- Intermittent and hard faults can be inserted using the Instructor's Management Program (IMP) via a computer connected to the trainer or over the ATech Lab System (ALS)
- Hard faults can be inserted by using the built-in keypad on the Starting System Trainer.
- Ability to perform actual service manual test procedures
- Compatible with Instructor's Management Program (IMP)
- Courseware includes Instructor Guide, Student Manual, and Service Manual Information
- Battery posts are protected against polarity reversal
- Includes external power supply for uninterrupted fault operation
- User interface displays built-in scan tool data

# Electrical / Electronic Systems

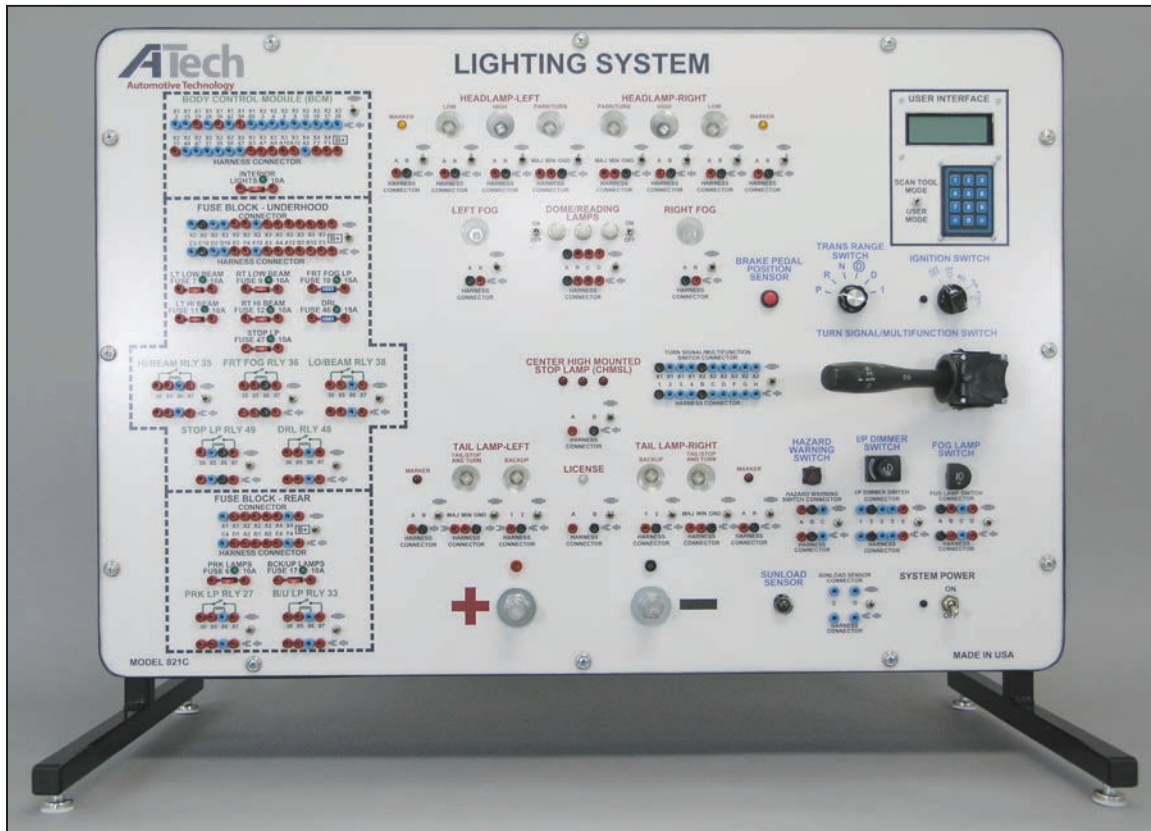


The ATech Charging System Trainer (model 812C) is part of an electrical system program which presents the live operation and study of charging systems. This trainer allows for instructor demonstration, student hands-on reinforcement, and troubleshooting practice. Powered by a 12VDC automotive battery (not included). The Charging System Trainer is based on a CAN platform vehicle.

## Features:

- New vehicle components, connectors, and factory wire colors
- Provides an advanced level of instruction by duplicating actual on-vehicle troubleshooting procedures
- Intermittent and hard faults can be inserted using the Instructor's Management Program (IMP) via a computer connected to the trainer or over the ATech Lab System (ALS)
- Hard faults can be inserted by using the built-in keypad on the Charging System Trainer
- Ability to perform service manual test procedures
- Compatible with Instructor's Management Program (IMP)
- Courseware includes Instructor Guide, Student Manual, and Service Manual Information
- Battery posts are protected against polarity reversal
- Includes external power supply for uninterrupted fault operation
- User interface displays built-in scan tool data

# Electrical / Electronic Systems



The ATech Lighting System Trainer (model 821C) is designed to teach computer and network-controlled automotive lighting system operation. This trainer allows for instructor demonstration, student hands-on reinforcement, and troubleshooting practice. Powered by a 12VDC automotive battery or a 12VDC/23AMP (minimum) power supply (not included). The Lighting System is based on a CAN platform vehicle.

## Features:

- New vehicle components, connectors, and factory wire colors
- Provides an advanced level of instruction by duplicating actual on-vehicle troubleshooting procedures
- Intermittent and hard faults can be inserted using the Instructor's Management Program (IMP) via a computer connected to the trainer or over the ATech Lab System (ALS)
- Hard faults can be inserted by using the built-in keypad on the Lighting System Trainer
- Ability to perform actual service manual test procedures
- Compatible with Instructor's Management Program (IMP)
- Courseware includes Instructor Guide, Student Manual, and Service Manual Information
- Battery posts are protected against polarity reversal
- Includes external power supply for uninterrupted fault operation
- User interface displays built-in scan tool data

# Electrical / Electronic Systems



The ATech Wiper / Washer System Trainer (model 830C) is part of an electrical system program which presents the live operation and study of wiper / washer systems. This trainer allows for instructor demonstration, student hands-on reinforcement, and troubleshooting practice. Powered by a 12VDC automotive battery or a 12VDC/23A power supply (not included). The Wiper / Washer System is based on a CAN platform vehicle.

## Features:

- New vehicle components, connectors, and factory wire colors
- Provides an advanced level of instruction by duplicating actual on-vehicle troubleshooting procedures
- Intermittent and hard faults can be inserted using the Instructor's Management Program (IMP) via a computer connected to the trainer or over the ATech Lab System (ALS)
- Hard faults can be inserted by using the built-in keypad on the Wiper / Washer System Trainer
- Ability to perform actual service manual test procedures
- Compatible with Instructor's Management Program (IMP)
- Courseware includes Instructor Guide, Student Manual, and Service Manual Information
- Battery posts are protected against polarity reversal
- Includes external power supply for uninterrupted fault operation
- User interface displays built-in scan tool data

# Electrical / Electronic Systems

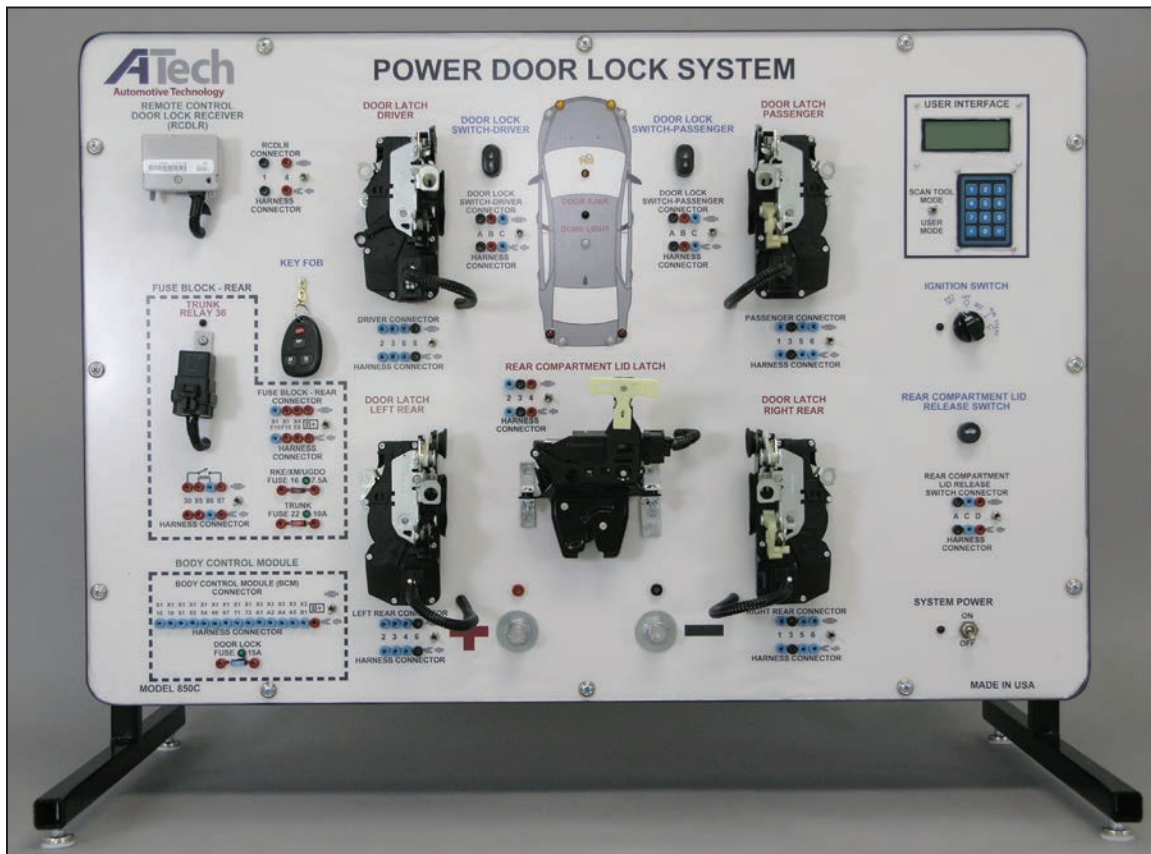


The ATech Power Window System Trainer (model 840C) is designed to teach computer and network-controlled automotive power window operation. This trainer allows for instructor demonstration, student hands-on reinforcement, and troubleshooting practice. Powered by a 12VDC automotive battery or a 12VDC/23A power supply (not included). The Power Window System is based on a CAN platform vehicle.

## Features:

- New vehicle components, connectors, and factory wire colors
- Provides an advanced level of instruction by duplicating actual on-vehicle troubleshooting procedures
- Intermittent and hard faults can be inserted using the Instructor's Management Program (IMP) via a computer connected to the trainer or over the ATech Lab System (ALS)
- Hard faults can be inserted by using the built-in keypad on the Power Window System Trainer
- Ability to perform actual service manual test procedures
- Compatible with Instructor's Management Program (IMP)
- Courseware includes Instructor Guide, Student Manual, and Service Manual Information
- Battery posts are protected against polarity reversal
- Includes external power supply for uninterrupted fault operation

# Electrical / Electronic Systems

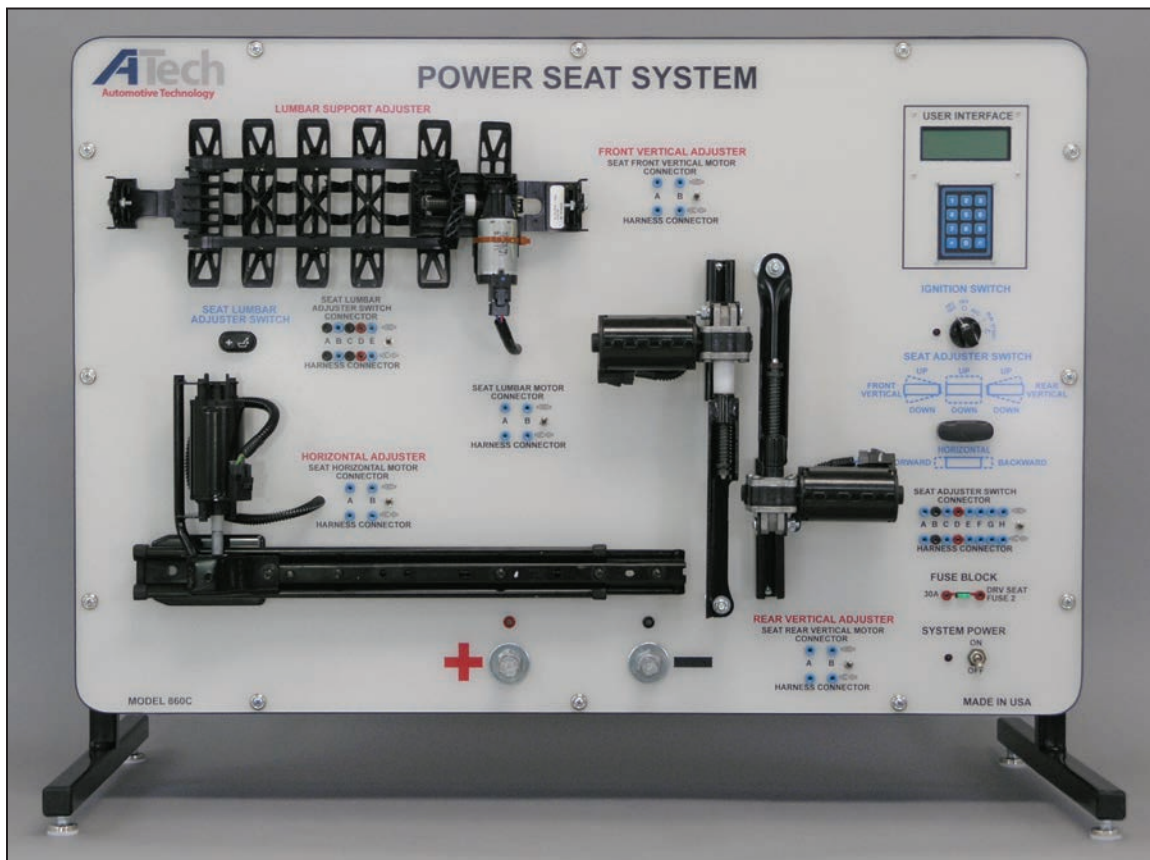


The ATech Power Door Lock System Trainer (model 850C) is designed to teach computer and network-controlled automotive door lock and theft deterrent system operation. This trainer allows for instructor demonstration, student hands-on reinforcement, and troubleshooting practice. Powered by a 12VDC automotive battery or a 12VDC/23A power supply (not included). The Power Door Lock System is based on a CAN platform vehicle.

## Features:

- New vehicle components, connectors, and factory wire colors
- The key fob can be used to lock and unlock the doors
- Built-in horn (buzzer)
- Provides an advanced level of instruction by duplicating actual on-vehicle troubleshooting procedures
- Intermittent and hard faults can be inserted using the Instructor's Management Program (IMP) via a computer connected to the trainer or over the ATech Lab System (ALS)
- Hard faults can be inserted by using the built-in keypad on the Power Door Lock System Trainer
- Ability to perform actual service manual test procedures
- Compatible with Instructor's Management Program (IMP)
- Courseware includes Instructor Guide, Student Manual, and Service Manual Information
- Battery posts are protected against polarity reversal
- Includes external power supply for uninterrupted fault operation
- User interface displays built-in scan tool data

# Electrical / Electronic Systems



The ATEch Power Seat System Trainer (model 860C) is part of an electrical system program which presents the live operation and study of power seat systems. This trainer allows for instructor demonstration, student hands-on reinforcement, and troubleshooting practice. Powered by a 12VDC automotive battery or 12VDC/23A power supply (not included). The Power Seat System is based on a CAN platform vehicle.

## Features:

- Actual vehicle components, connectors, and factory wire colors
- Provides an advanced level of instruction by duplicating actual on-vehicle troubleshooting procedures
- Intermittent and hard fault codes can be inserted using the Instructor's Management Program (IMP) via a computer connected to the trainer or over the ATEch Lab System (ALS)
- Hard faults can be inserted by using the built-in keypad on the Power Seat System Trainer
- Ability to perform actual service manual test procedures
- Compatible with Instructor's Management Program (IMP)
- Courseware includes Instructor Guide, Student Manual, and Service Manual Information
- Battery posts are protected against polarity reversal
- Includes external power supply for uninterrupted fault operation

# Electrical / Electronic Systems

## Electrical / PWM / Fault Trainer model 2210



The Electrical / PWM / Fault Trainer is designed to introduce the concepts of Electrical Fundamentals, Pulse Width Modulation (PWM) Actuator Control, and Fault Diagnosis. The trainer is compact, self-contained, and provides a PWM output to view the signal on an oscilloscope.

### Components and Capabilities:

- Power supply providing 12VDC
- Four different value electrical loads
- ON / OFF switch with LED indicator
- Banana jacks for making wiring connections
- Connector wires in three colors
- Auxiliary jacks for testing external components
- Ground jack
- Fuse for circuit / device protection
- Four-position switch for inserting faults: (Open, High Resistance, Short to Ground, Short to Voltage)
- Faulted / non-faulted switch
- PWM (duty cycle) output control knob
- High / low frequency selector switch
- PWM output jack
- Optional Submounts (see page 28) and Storage Case (see page 46) available

### Subject Areas:

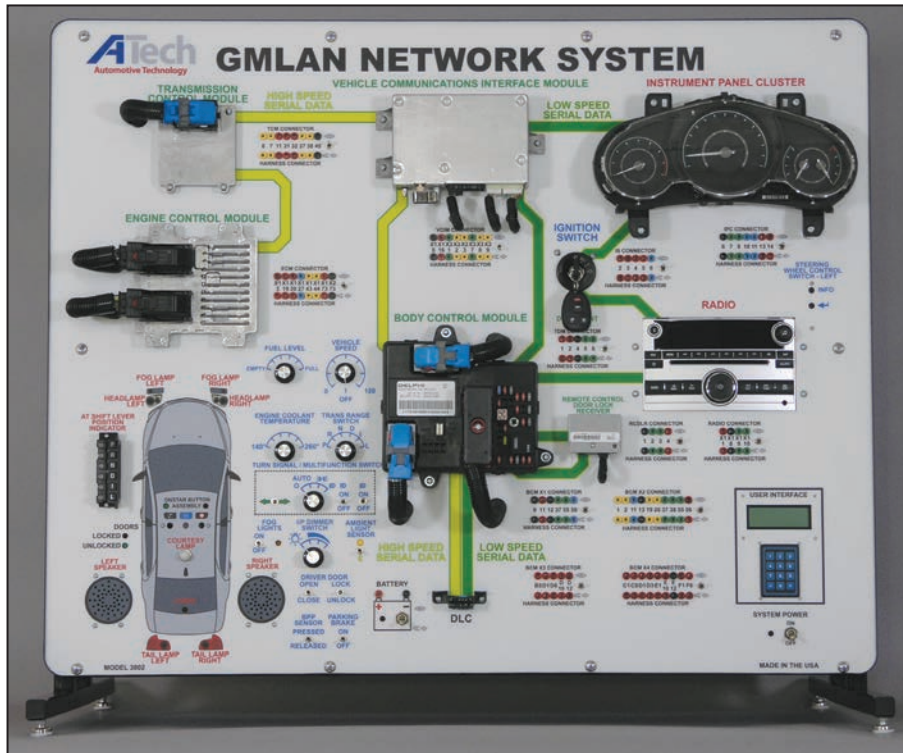
- Voltage
- Current
- Resistance
- Power
- Voltage Drop
- Series Circuits
- Parallel Circuits
- Series-Parallel Circuits
- Ohm's Law Relationships
- Ohm's Law Calculations
- Pulse Width Modulation Control
- Circuit Operation
- Fault Diagnosis

This trainer is intended to provide instructors the flexibility to not only create their own circuits but to develop the corresponding measurement and diagnostic procedures as needed for Electricity, PWM, and Faulting.

**Contact A-Tech for information on customizing this trainer for your needs.**

A-Tech Training, Inc  
sales@atechtraining.com ♦ 1.888.738.9924  
Page 40

# Electrical / Electronic Systems



Student Response  
and Local Fault  
Insertion Panel

## GMLAN Network System model 3802

The ATech CAN Network System offers a real-world look into the network operation of present day vehicles. The CAN Network System can be connected to local networks for remote fault insertion using the ATech Lab System (ALS).

### Activities:

- Reading and Clearing DTCs
- Driver Information Center Warning Message Display
- Instrument Panel Cluster Response to CAN Messaging
- Radio Module Response to CAN Messaging
- Diagnostic Circuit Check
- Power Mode Test
- On-Star Operations
- Theater Lighting Effects
- Body Control Module Operation
- Remote Lock Operation
- Vehicle Speed Messaging
- Engine Temperature Messaging
- Fuel Level Messaging
- Gear Selection Messaging
- Reading all Module Parameter Identifications (PIDs)
- Scan Tool Output Operations
- CAN Network Faults
- CAN Network Electrical Troubleshooting

### Features:

- New vehicle components, connectors, and factory wire colors
- Provides an advanced level of instruction by duplicating actual on-vehicle troubleshooting procedures
- Intermittent and hard faults can be inserted using the Instructor's Management Program (IMP) via a computer connected to the trainer or over the ATech Lab System (ALS)
- Hard faults can be inserted by using the built-in keypad on the GM LAN Network System
- Ability to perform actual service manual test procedures
- Compatible with Instructor's Management Program (IMP)
- Courseware includes Instructor Guide, Student Manual, and Service Manual Information

# Electrical / Electronic Systems

## Applied Electrical Trainer model 4810



The Applied Electrical Trainer (AET) is a self-contained training device for the study of electricity and electrical circuits.

### Components and Capabilities:

- Power supply with dual voltages (12V and 5V)
- Eleven 'loads' including both resistors and lamps
- ON / OFF switch with indicator light
- Banana jacks for making wire connections
- Connector wires in three colors
- Auxiliary jacks for an additional component
- Toggle and momentary switches
- Two ground connection points
- Circuit breaker for device protection
- A compact durable enclosure
- Courseware includes Student Manual and Instructor Guide

### Subject Areas:

- Voltage
- Current
- Resistance
- Power
- Voltage Drop
- Series Circuits
- Parallel Circuits
- Series-Parallel Circuits
- Meter Usage including Prefix Conversion
- Ohm's Law Voltage / Current and Resistance / Current Relationships
- Ohm's Law Value Calculations
- Diagnostic Testing

This training unit also has the flexibility to allow instructors to create their own circuits and/or tests for measurement and evaluation. Optional Submounts (see page 28) and Storage Case (see page 46) available.

# Engine Performance

This trainer offers a hands-on study of OBD II technology with complete powertrain control, OBD II monitors, standard diagnostic features and performance of trip / drive cycles.

**NO OTHER CLASSROOM TRAINERS OFFER THESE FEATURES.**



Student Response and Local Fault Insertion Panel

## GM OBD II System model 2652

- Engine and transmission control
- Compatible with OBD II scan tools
- Performs GM OBD II drive cycle
- Enhanced diagnostics with code, engine protection and OBD II faults
- Interface with Electronic Ignition (EI) System (model 1772)
- Compatible with the ATech Lab System (ALS) and Instructor's Management Program (IMP)
- Courseware and Service Manual information included

# Engine Performance

## Intermittent Fault Box model 2112

### Features:

The Intermittent Fault Box provides a means of faulting circuits in vehicles.

- Faulted circuits are connected through standard banana jacks. The following faults can be inserted:
  - » Open
  - » Incorrect Resistance
  - » Short to Ground
  - » Short to Voltage
- Fault duration switch
- Time between fault switch
- Hard and intermittent switch



*"I am extremely grateful to be able to work with a company that goes above and beyond to help out their customers."*

Diesel Equipment Technology Instructor

The Single Source for Automotive Educators

### ATech's Programs Support

- ASE Task List
- Performance Based Education
- Career Tech Programs
- Transportation Programs
- Industry and Education Partnerships
- OEM Training

ATech's Engine Performance programs are at the heart of ATech's business - just as these systems are the heart of today's automobiles.

# Accessories



## Optional Floor Model Legs model TFMJ

- Engine Cooling Fan System - 310FJ
- Blower Control System - 320FJ
- EVAP System - 640
- Starting System - 811C
- Lighting System - 821C
- Wiper / Washer System - 830C
- Power Window System - 840C
- Power Door Lock System - 850C
- Power Seat System - 860C
- Supplemental Inflatable Restraint System - 1552
- GM Electronic Ignition (EI) System 1772
- Ford Integrated Electronic Ignition System 1792

Optional Floor Model Legs  
model TFMJ



## Optional Floor Model Legs model TFM

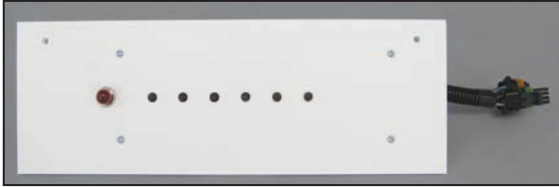
- Delco DBC7 ABS/TCS System - 1432
- GM (J1850) OBD II System - 2652
- GM (J1850) OBD II System - 2652DRY
- GMLAN Network System - 3802
- GM 6.5L Diesel (ECM) System - 6611

Optional Floor Model Legs model TFM

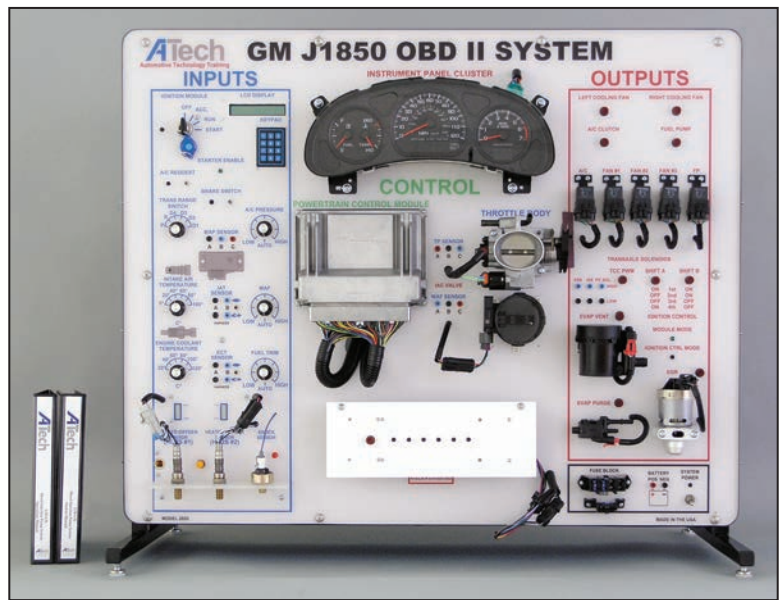
# Accessories

## Dry Panel Option

- Fuel Injection and Ignition Trainer Interface: (Required for connection of ignition system to fuel injection trainer)
- GM OBD II - GM Electronic Ignition System Cable (model 2657)
- Dry Option: Simulated Fuel Injection / Pump - GM OBD II (Dry) - model 2652 DRY



Dry Panel Option



GM OBD II System (DRY)  
model 2652 DRY

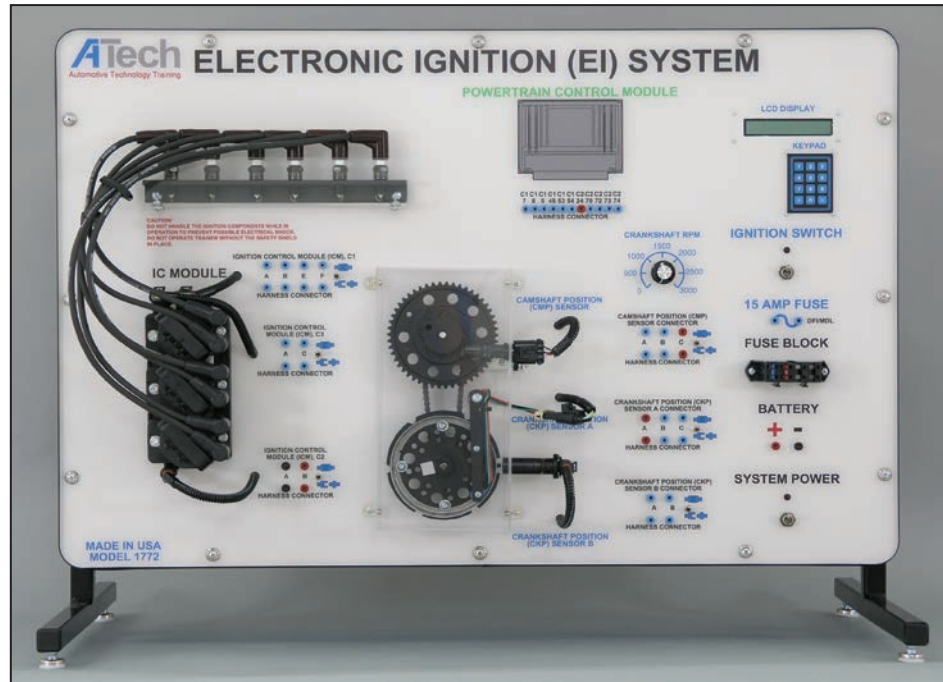
## Optional Storage Case

- Electrical / PWM / Fault Trainer model 2210 (see page 40)
- Applied Electrical Trainer model 4810 (see page 42)



# Engine Performance

## Electronic Ignition (EI) System model 1772



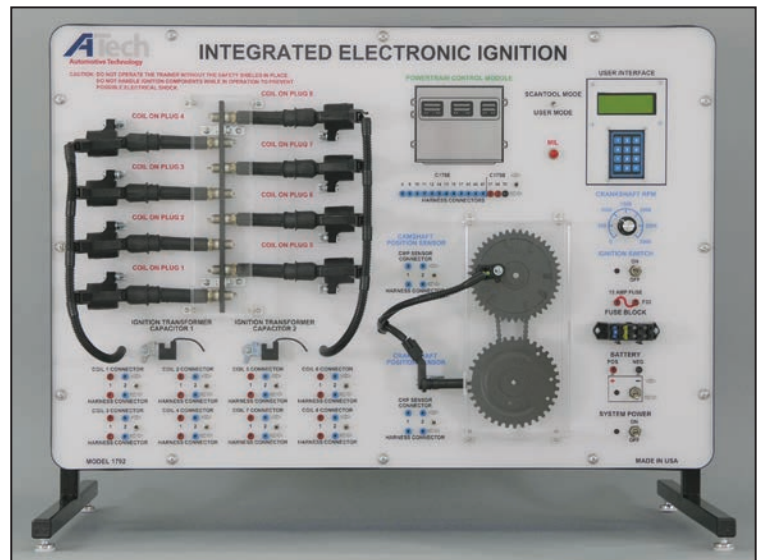
### Features:

- The Electronic Ignition (EI) Trainer demonstrates the operation of a GM six-cylinder electronic ignition system
- Uses actual automotive components including:
  - » Hall-Effect Crankshaft Position Sensor (CKP-A)
  - » Magnetic Generator Type Crankshaft Position Sensor (CKP-B)
  - » Hall-Effect Type Camshaft Position Sensor (CMP)
  - » Ignition Control Module
  - » Three Dual-Tower (Waste Spark) Coils
  - » 6 Spark Plugs and Spark Plug Wires
  - » 24 "Window" / 7X Crankshaft Wheel
  - » Camshaft Wheel
- Aids in developing real-world system skills and knowledge
- DVOM test points and harness disconnect switches for the following signals:
  - » Ignition Control Module Connectors 1, 2, and 3
  - » Crankshaft Position Sensor A
  - » Crankshaft Position Sensor B
  - » Camshaft Position Sensor
- Additional DVOM test points for:
  - » PCM
  - » Battery (12V) and Ground
  - » Fuse
- Speed variable from 0 - 3,000 RPM
- Faults can be inserted using the built-in keypad or using the Instructor's Management Program (IMP) via the ATech Lab System (ALS)
- Internal 12V power supply
- Courseware is included (Student Manual, Instructor Guide, Service Manual Information)
- Connects with GM OBD II System - model 2652 (see page 43)

# Engine Performance

## Integrated Electronic Ignition System model 1792

- Coil on plug ignition system
- Real world system skills and knowledge
- Live component operation
- Crank and cam sensors
- Probe points for DMM or oscilloscope
- Courseware included
- Network / local fault insertion



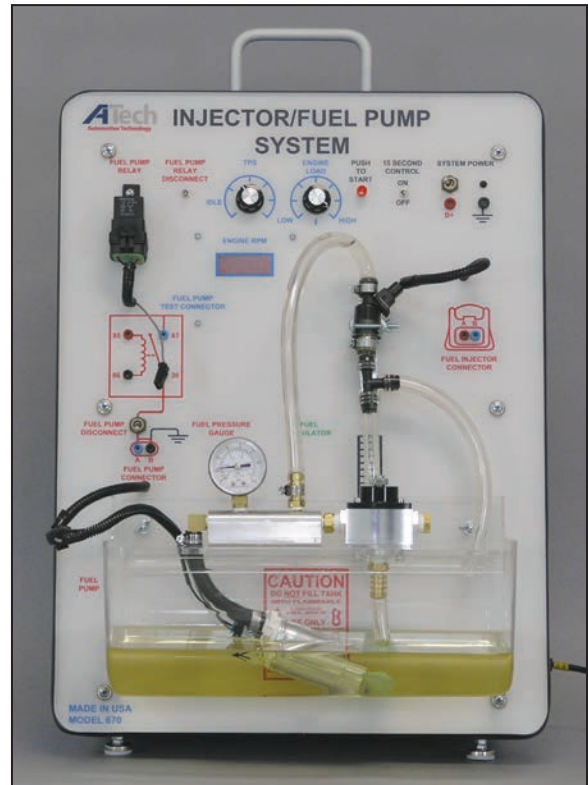
## GM Direct Ignition System Faulted model 1711F

- Used by GM Training Centers
- Live component operation
- Magnetic generator sensor type
- Realistic troubleshooting
- Courseware included
- Network / local fault insertion (Keypad required model 1802)



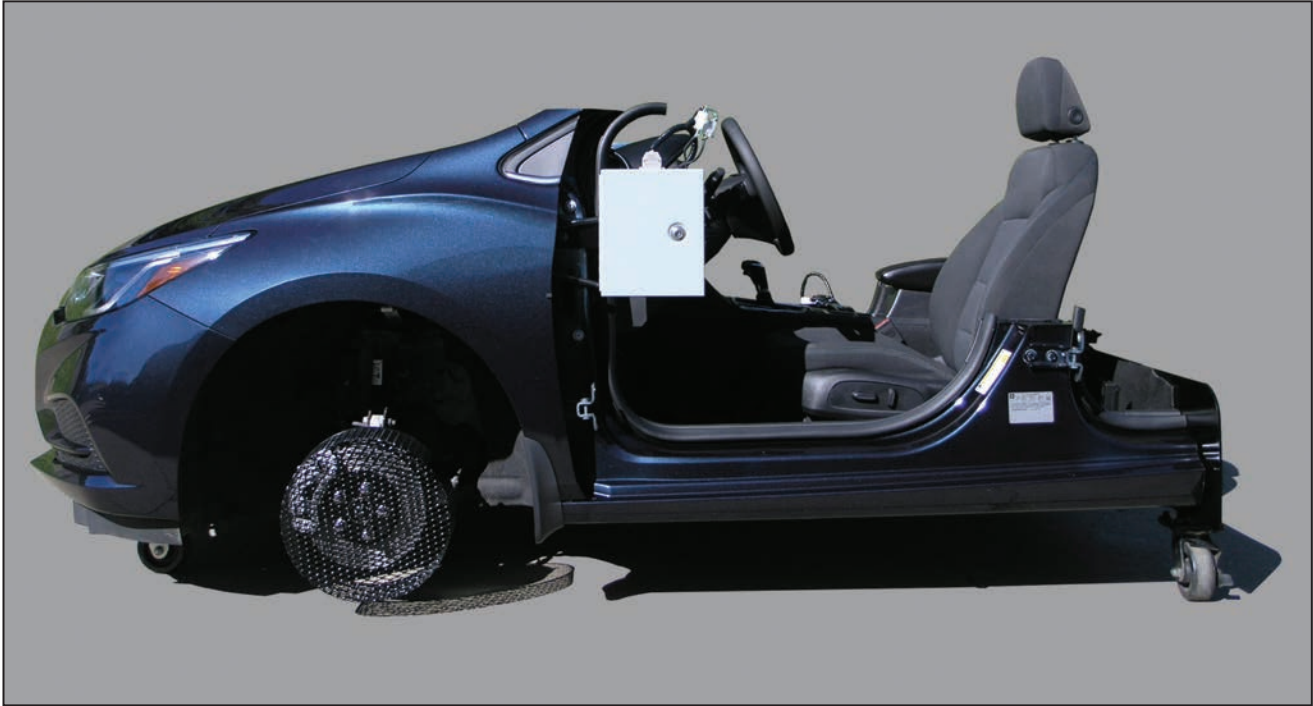
## Injector / Fuel Pump System model 670

- Realistic fuel pump and injector operation
- Adjustable RPM control
- Digital RPM readout
- Adjustable engine "load"
- Easy injection fuel volume measurement
- Adjustable fuel regulation pressure
- 15 sec. timer for fuel volume measurement incorporated into trainer
- Automatic operation in timer mode
- Fuel pump relay control circuit
- Injector terminal test points
- Fuel pump terminal test points
- RPM speeds from 200 to 5140
- Courseware included



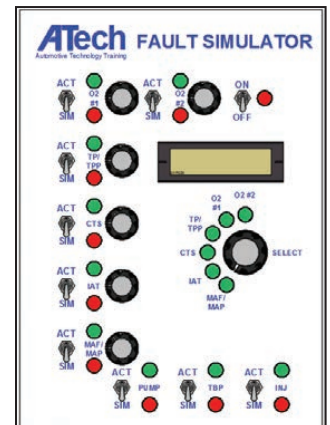
# Engine Performance

## Automotive Technology Trainer model 600



### Features:

- The Automotive Technology Trainer or “car clip” is a late-model recycled front-wheel-drive vehicle
- Assists in the study and diagnosis of most automobile systems including:
  - » Engine Performance
  - » Electrical / Electronic
  - » Suspension / Steering
  - » Brake
  - » Heating / Air Conditioning
  - » Transmission
- Aids in developing real-world system skills and knowledge
- Performs actual service manual diagnostic procedures
- Includes an ATech Fault / Simulator Panel with multiple faulting options and features including:
  - » Real-time voltage readouts for various selectable sensors
  - » Individual or multiple sensors are selectable for voltage substitution
  - » Voltage adjustment potentiometers for each sensor
  - » Interactive demonstration / study of fuel control by oxygen sensor feedback
  - » Demonstrates catalytic converter “punch-through”
  - » Investigates downstream oxygen sensor’s control of fuel trim
  - » And much more...
- Trainer sits on casters for ease of mobility
- Courseware is included (Service Manual sold separately)



# Engine Performance

## Evaporative Emission System model 640



This ATech trainer presents the live operation and study of a late-model General Motors enhanced evaporative emissions (EVAP) system. The trainer will run the GM Service Bay EVAP Test using either its built-in scan tool or a Tech 2™. Realistic EVAP system faults, including system leaks, can be inserted via a built-in keypad, a local computer or via the optional ATech Lab System (ALS) to give students troubleshooting practice. Students follow manufacturer's diagnostic procedures when troubleshooting system faults. Diagnosing system leaks is enhanced by the clear hoses when using a smoke machine. Tech 2™ and smoke machine are NOT included with the trainer. Includes courseware.

### Activities Include:

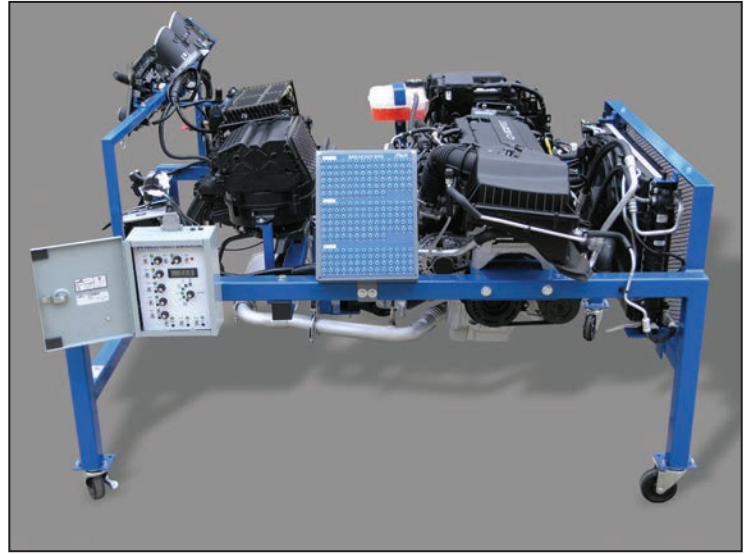
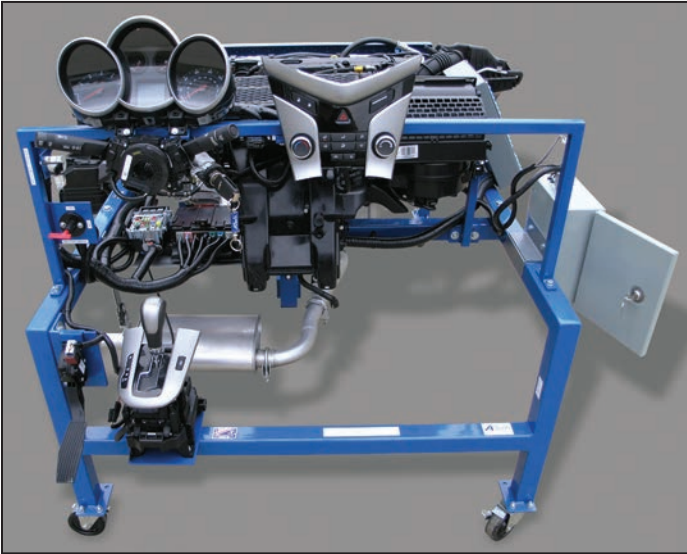
- Description and operation of the EVAP system trainer
- Analyzing and interpreting schematics and manufacturer's troubleshooting and service procedures
- System diagnosing and troubleshooting
- Engine off natural vacuum (EONV) test demonstration

*"I've used ATech Trainers for years. Very satisfied always..."*

Vale Technical Institute  
Blairsville, PA

# Engine Performance

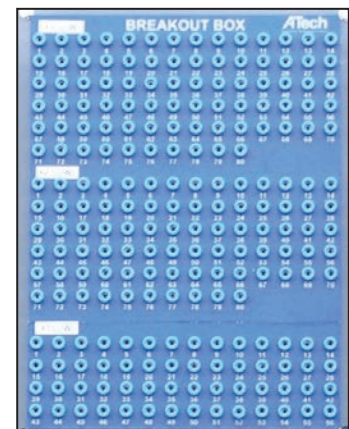
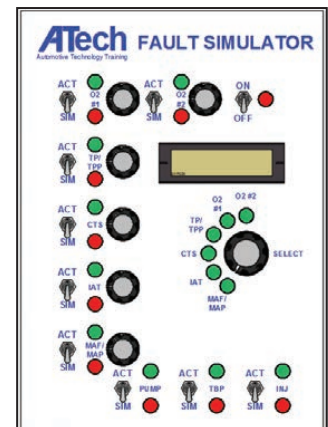
## Engine Performance Trainer model 650



**GM • FORD • CHRYSLER • IMPORT**  
**GDI • VVT • COMMON RAIL • TURBO**

### Features:

- Late-model recycled vehicle (front or rear wheel drive)
- Includes following automotive systems:
  - » Engine (4 – 8 cylinder, gas or diesel)
  - » Transmission (automatic or manual)
  - » Heat / Ventilation / Air Conditioning
  - » Electrical
  - » Exhaust
  - » Engine Cooling
  - » Emissions
- Includes an ATech Fault / Simulator Panel with multiple faulting options / features:
  - » Real-time voltage readouts or various selectable sensors
  - » Individual or multiple sensors are selectable for voltage substitutions
  - » Voltage adjustment potentiometers for each sensor
  - » Interactive demonstration / study of fuel control by oxygen sensor feedback
  - » Demonstrates catalytic convertor punch-through
  - » Investigates downstream oxygen sensor's control of fuel trim
- Data link connector (DLC) for scan tool diagnostics
- Breakout box with test points for every PCM pin
- Aids In developing real-world system skills and knowledge
- Performs actual service manual diagnostic procedures
- Courseware included (Service Manual sold separately)
- Powder-coated frame mounted on casters for ease of mobility

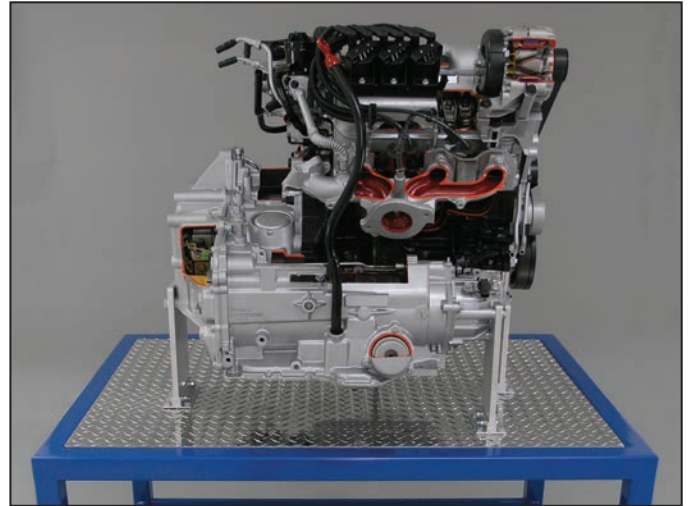


# Engine Performance

## GM Cutaway model 680



**GM Cutaway  
SIDE VIEW (model 680)**



The Engine Cutaway Trainer (model 680) is a complete GM engine with sections cutaway to expose the internal mechanical operating systems. Intake, exhaust, cooling, and lubrication systems are color coded to provide visual cues and allow for easy identification. This training unit includes an electric motor which rotates the engine at a low RPM to show the operation and interaction of the internal working components.

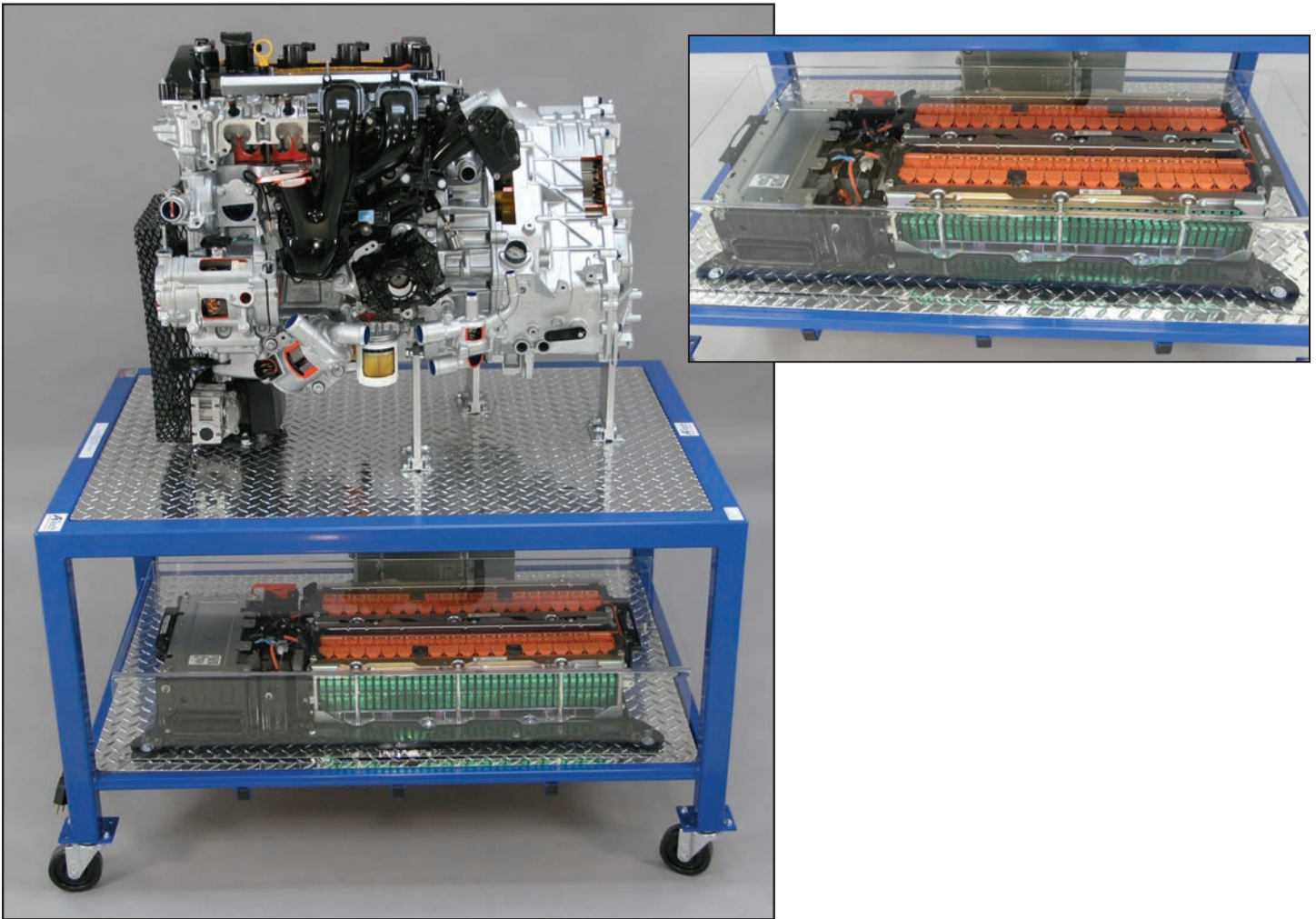
The Engine Cutaway Trainer uses an actual late-model engine and transaxle.

### **Cutaway Views:**

- Engine
- Pistons
- Cam Operations
- Rings
- Crank Operations
- Oil Filter
- Oil Pick-up
- Intake Manifold
- Oil Pump
- Exhaust Manifold
- Coolant System
- Cylinder Walls
- Water Pump
- Fuel Rail
- Power Steering Pump
- Ignition
- A/C Compressor
- Transaxle
- EGR
- Flywheel
- Throttle Body
- Torque Converter
- Timing Chain
- Valve Body
- Intake Valve with Seat
- Clutches
- Exhaust Valve with Seat
- Bands
- Valves
- Band Servos
- Valve Springs
- Shift Interlock
- Rocker Arms
- Output Speed Shaft
- Push Rods
- VSS Sensor
- Connecting Rods
- Transaxle Filter

# Engine Performance

## Toyota Hybrid Cutaway Trainer model 680 Special



The Hybrid Cutaway Trainer (model 680 Special) is a complete Toyota Hybrid I-4 engine and planetary gear with sections cut away to expose the internal mechanical and electrical operating systems. Intake, exhaust, cooling, and lubrication systems are color coded to provide visual cues and allow for easy identification. This training unit includes an electric motor which rotates the engine at a low RPM to show the operation and interaction of the internal working components. A Reference Package is provided which includes service information specific to this engine.

# Suspension and Steering

## Suspension and Steering System model 500



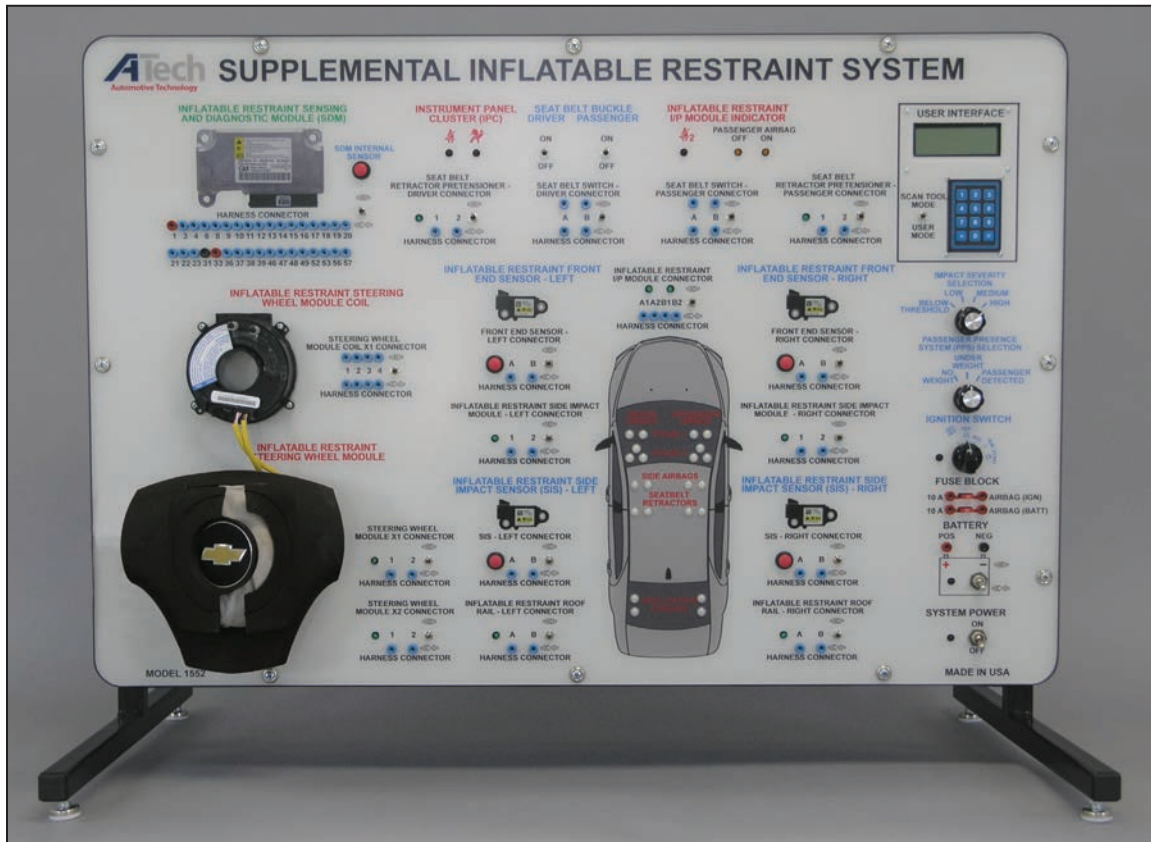
- Recycled vehicle components
- Includes operating McPherson struts, rack and pinion, and power steering
- On-board hydraulics operate suspension without impairing wheels
- Folding steering wheel and casters for easy storage
- Powder-coated frame
- Courseware included

*"My new ATech Trainers are excellent teaching tools for student technicians...the units are user-friendly...the course materials and trainers have been designed so each person using this system can learn by doing. These trainers are a great help to me as a teacher to better manage student time. It works!"*

Gulf Coast Community College  
Gautier, MS

# Suspension and Steering

## Supplemental Inflatable Restraint System model 1552



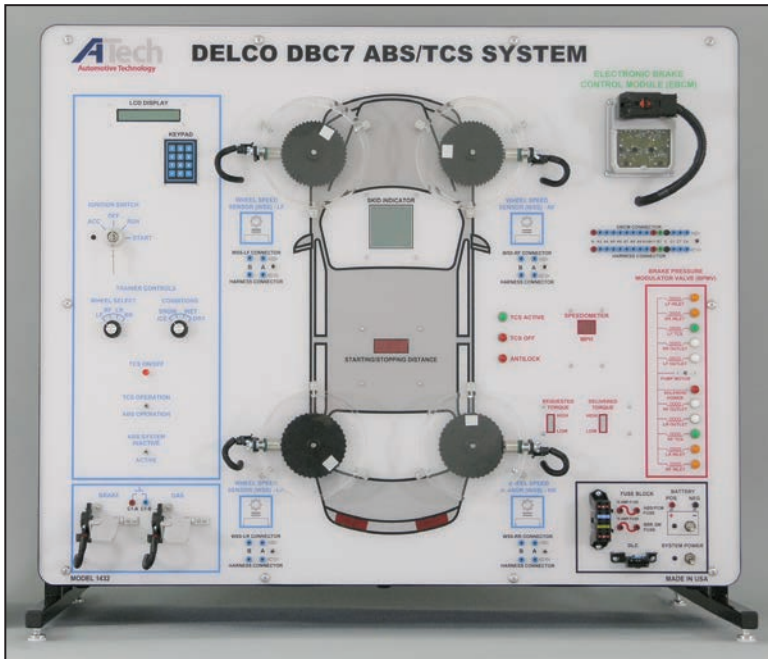
The trainer uses an actual SIR system that electrically responds and operates as in the automobile. The airbag portion of the trainer is a non-functional disarmed unit. The Supplemental Inflatable Restraint System is based on a CAN platform vehicle.

### Features:

- Actual vehicle components, connectors, and factory wire colors
- Provides an advanced level of instruction by duplicating actual on-vehicle troubleshooting procedures
- Intermittent and hard faults can be inserted using the Instructor's Management Program (IMP) via a computer connected to the trainer or over the ATech Lab System (ALS)
- Hard faults can be inserted by using the built-in keypad on the Supplemental Inflatable Restraint System
- Ability to perform actual service manual test procedures
- Compatible with Instructor's Management Program (IMP)
- Courseware includes Instructor Guide, Student Manual, and Service Manual Information
- Crash simulation using sensor impact push switches and bag deployment strobe
- Study of removal and installation of system components
- Performing airbag disposal procedures
- Includes external power supply for uninterrupted fault operation
- User interface displays built-in scan tool data

# Brakes

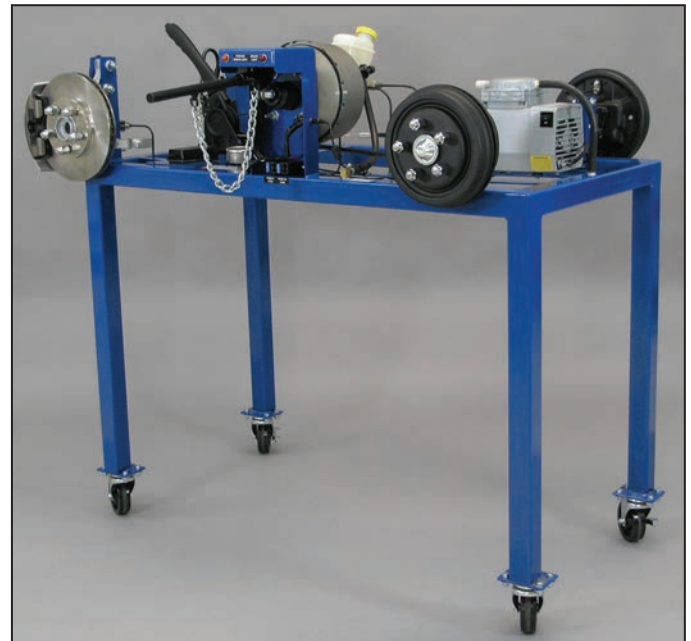
## DELCO DBC7 ABS / TCS System model 1432



- Realistic accelerator and brake pedal operation
- Selection of "controlled wheel" (LR, RF, LR, RR)
- Road condition selections: dry, wet, snow or ice
- Anti-lock mode or traction control mode operation
- Class 2 "bus" for communications with Tech 2™ scan tool recommended (Tech 2™ not included)
- Torque request / torque delivered indicators
- BPMV solenoid operation indicators
- Fault insertion locally with keypad or remotely via IMP (Instructor's Management Program)
- Courseware included

## Drum / Disc Brake Trainer Features:

- Recycled drum / disc brakes
- Operating hydraulic system
- Includes: power assist, parking brake, electrical circuits and wheel bearings
- Real world system skills and knowledge
- Powder-coated frame
- Courseware included



## Drum / Disc Brake (4-Wheel) model 400-4W

# Heating and Air Conditioning



Side View

## Air Conditioning with Automatic Climate Control model 1351

- Functional R134A A/C system
- Automatic / manual dual zone climate control
- Compact variable compressor (CVC6)
- Thermostatic expansion valve (TXV)
- Includes refrigerant 'liquid line' control valve for "pressure faulting"
- Electrical faulting either locally via keypad or remotely via IMP
- Selectable interior temperature settings
- Tip jacks for DVOM measurements
- 220V 5HP motor
- Powder-coated frame
- Courseware included

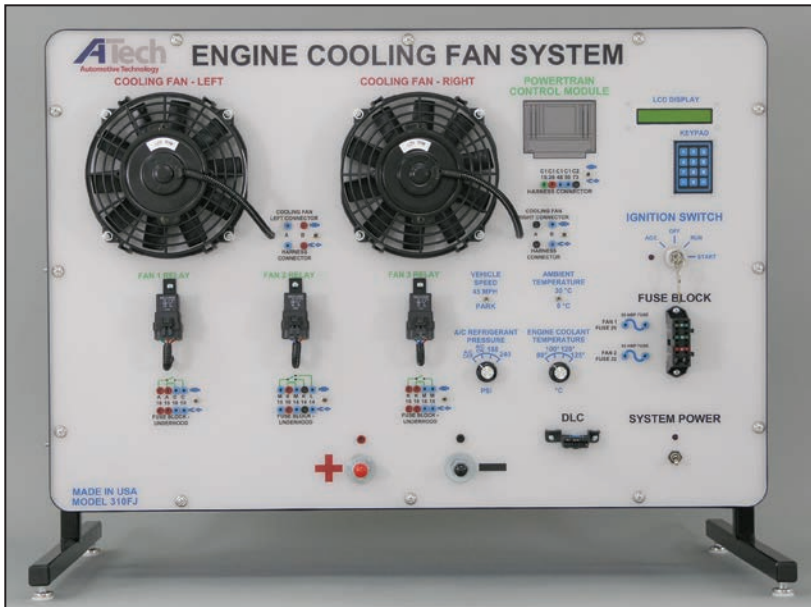
## Activities Include:

- Principles of refrigeration
- Basic refrigerant cycle
- Compressors & control components
- Condenser and evaporator
- Receiver-dryer / accumulator
- Metering components
- Safety precautions & environmental concerns
- Refrigerant system tests
- Leak detection
- Refrigerant system recovery, recycling & recharging
- Cooling fan operation
- Cooling fan diagnosis
- Air distribution overview and controls
- Blower controls and diagnosis
- Automatic climate control operation
- Automatic climate control diagnostics
- Strategy-based diagnosis



Front View

# Heating and Air Conditioning



**Engine Cooling Fan System  
model 310FJ**

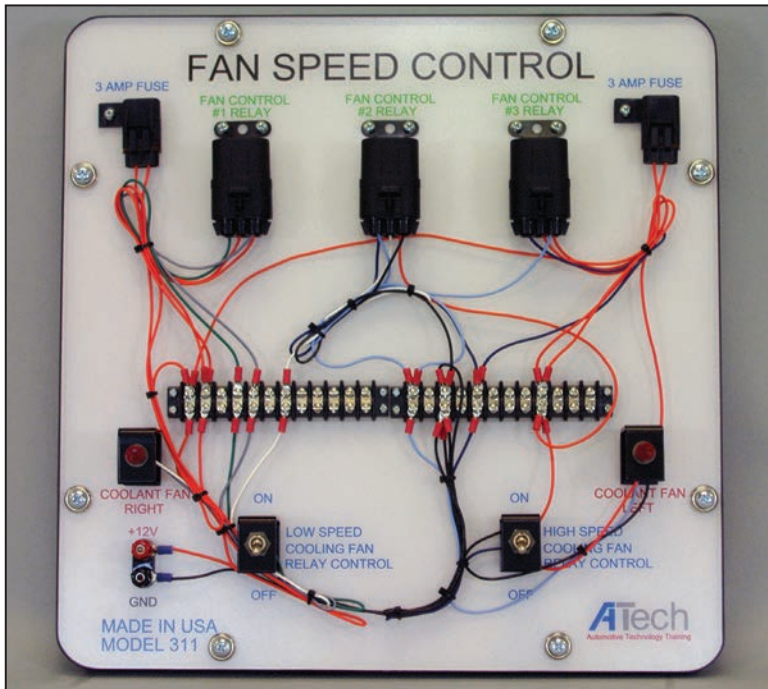
- Presents the live operation and study of a late-model system
- New-model vehicle components and connectors
- Capable of actual service manual test procedures
- Connects to Tech 2™ scan tool from DLC connector (Tech 2™ not included)
- Courseware included

- Faults can be inserted via keypad, local computer, or ATech Lab System (ALS)
- Includes internal power supply for fault activation
- Power provided by 12 VDC battery or external power supply (option available)
- Courseware included



**Blower Control System  
model 320FJ**

# Heating and Air Conditioning



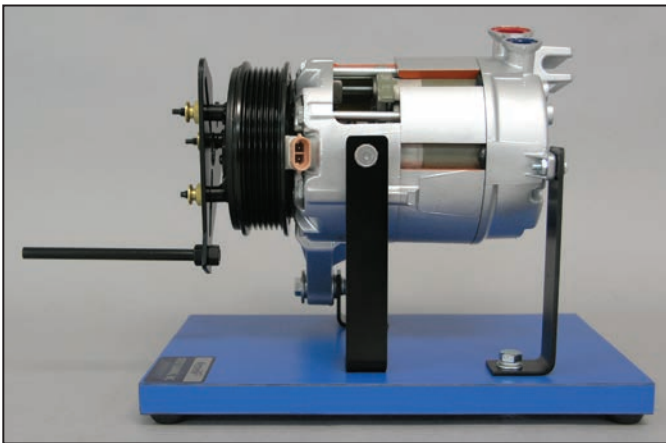
*\* Requires 12VDC Power Supply*

## Fan Speed Control Trainer model 311

This ATech trainer presents the hands-on construction, study and live operation of a Fan Speed Control System as found on late-model General Motors vehicles. Students follow printed schematics to wire up either a single speed single fan system or a two-speed two fan system. The trainer circuits use the same wire colors as the manufacturer's wiring diagram. Incandescent bulbs are substituted for actual cooling fan motors for safety purposes.

### Activities Include:

- Cooling Fan Speed Control Operation
- Electrical Troubleshooting
- Reading, Analyzing and Interpreting a Wiring Diagram
- Relay and Series-Parallel Circuit Operation



## V5 Variable Displacement A/C Compressor Cutaway model 382

The A/C Compressor Cutaway (model 382) is a V5 Variable Displacement A/C Compressor. It includes a hand crank to rotate the compressor. The compressor is sectioned to show internal components and is mounted on a laminate base to provide stable display and use.

# Automatic Transmission / Transaxle

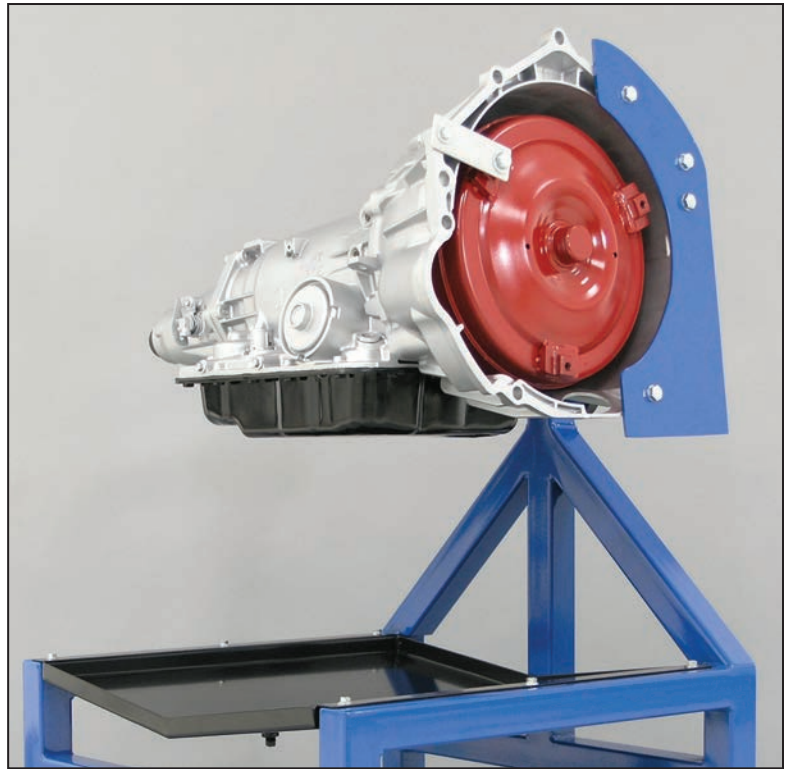


## Electronic Automatic Transaxle Rebuild model 1210

- Recycled transaxle
- Rotating rebuild stand with component storage and drain pan
- Powder-coated frame
- NATEF record keeping sheets included

## Electronic Automatic Transmission Rebuild model 1220

- Recycled transmission
- Rotating rebuild stand with component storage and drain pan
- Powder-coated frame
- NATEF record keeping sheets included



*"WOW? I am shocked, and pleased all at the same time! I would love to send you a picture of our lab when we get the new board. We are very proud of our set up and I am always looking for new things to add to it (we are almost out of room). I appreciate your help and you guys have always been very kind and helpful over the phone."*

### Automotive Electrical / Electronics Instructor

*"During the 'Train the Trainer' program for the LX5, many of the instructors were curious as to how ATech could make the trainer operate so realistically. Subsequently, the back was removed to view the internal components. The group was amazed. This trainer is, without a doubt, the most professionally designed and constructed trainer GM has ever had built." GM 3.5 Liter - LX5 Ignition*

General Motors  
Training Center Director

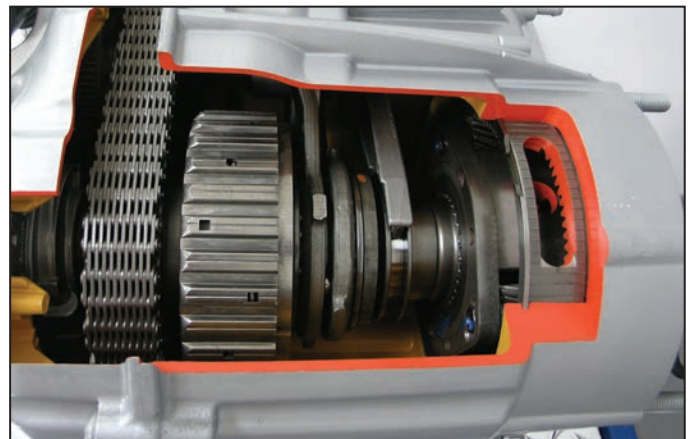
# Automatic Transmission / Transaxle



**Transfer Case Cutaway Trainer  
(Showing Planetary Gear System) model 1230**

The Transfer Case Cutaway Trainer presents the viewing and operation of a transfer case. It provides hands-on experience to complete NATEF Tasks.

- Actual late-model transfer case
- Case cutaway painted to enhance viewing
- Handle allows rotation of gears
- Mounted on a diamond plate and powder-coated metal frame



**Transfer Case (High Range Position)  
(model 1230)**



# Manual Drive Train and Axles



## Manual Transaxle Rebuild model 110

- Recycled transmission or transaxle with clutch
- Rotating rebuild stand with component storage and drain pan
- NATEF record keeping sheets included
- Powder-coated frame

## Locking Differential / Limited-Slip Rear Axle Cutaway model 126

- GM complete differential / axle
- Eaton limited-slip traction control system
- Carrier and pinion areas cutaway for easier viewing / instruction
- Powder-coated frame
- Includes casters to simplify movement



# Manual Drive Train and Axles



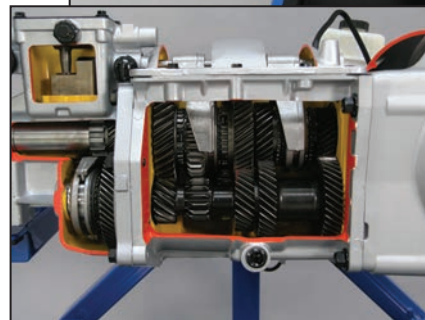
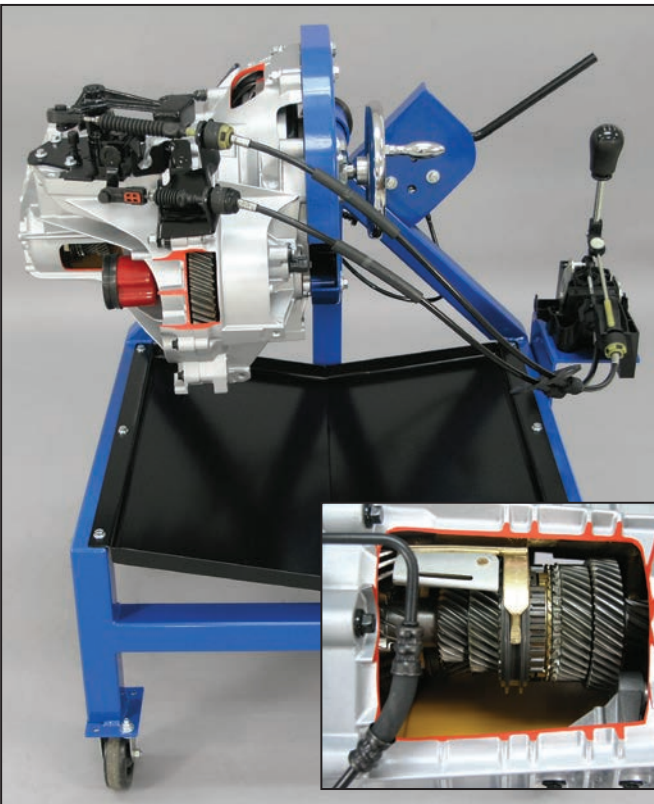
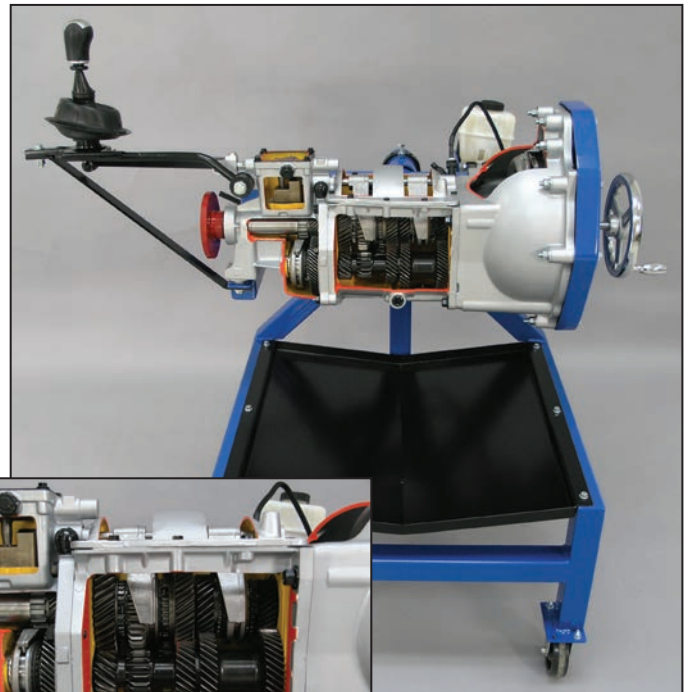
## Limited-Slip Rear Axle Cutaway model 127

- Recycled rear axle assembly
- Mobile stand
- Powder-coated frame



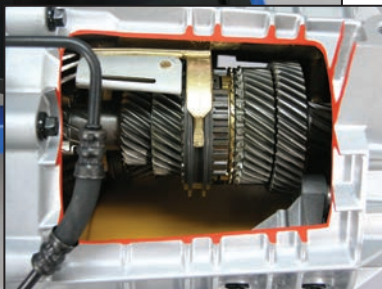
## Manual Transmission (RWD) Cutaway model 130

- Operating clutch and hand crank
- Recycled transmission
- Powder-coated frame

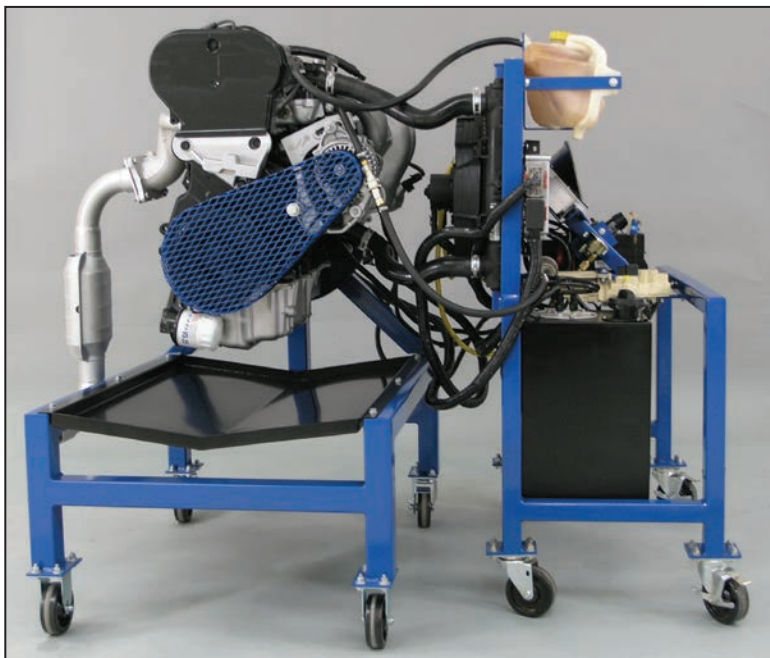


## Manual Transaxle (FWD) Cutaway model 140

- Recycled late-model manual transaxle complete with clutch assembly and gear shift
- Includes handles to operate clutch and rotate gear shifts
- Cutaway to show internal components
- Powder-coated frame



# Engine Repair



## Engine Repair / Engine Start Cart model 90/91

- Recycled Engine with rotating rebuild stand - model 90
- Engine Start Cart with necessary components to start engines - model 91
- NATEF record keeping sheets included
- Powder-coated frame

## Automotive / Education Industry Proven

*In addition to ATech's on-going support of public and private education, we work very closely with the automotive industry. Our users include:*

AC Delco  
Allied Signal  
American Honda Motor Company  
Atlanta Metro (MARTA)  
Automatic Transmission Rebuilders  
AVIS Rental Car Company  
B & B Electronics  
Bridgestone/Firestone  
Briggs-Weaver  
Canadian Military Forces  
Caterpillar  
Chinese Automobile Company  
Cincinnati Metro (SORTA)  
Correctional Facilities  
CT Transit  
Chrysler  
Delphi Delco Electronic System  
Egyptian Air Force  
Federal Mogul/Champion Spark Plug  
Ferrari  
Ferret Instruments

Ford Motor Company  
General Motors  
Georgia Power  
Goodyear Tire and Rubber  
Hyundai Motor America  
Job Corps Centers  
John Deere Corp.  
Kentucky DOT  
Lincoln Technical Institute  
L.J. Technical Systems  
Maserati  
Mazda Automotive Corp.  
Melior Institute  
Mercedes-Benz Institute  
Mitsubishi Automotive Co.  
Motorola Semi-Conductor Division  
Navistar  
Nissan  
No Lemon  
OTC  
Pennsylvania DOT

Pierce Transit  
Porsche  
Quaker State of Mexico  
Robert Bosch Corp.  
Royal Guard Oman  
Santa Clara Valley Transit  
Snap-On Tools  
SPX  
Standard Motor Products  
Sun Tran  
United States Air Force  
United States Army  
United States Government  
United States Navy Research  
United States Postal Service  
Universal Technical Institute  
VazMotor Company (Russia)  
Volkswagen  
Volvo  
Wyotech  
and many more...

# Bi-Fuel Engine Performance Trainer

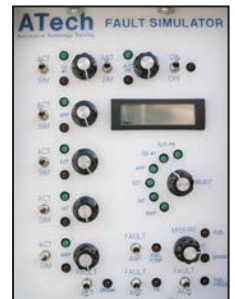
## Light / Medium Duty CNG / LPG



### Bi-Fuel Engine Performance Trainer model 650BF

#### Features:

- Late-model recycled vehicle (front wheel drive)
- Includes following automotive systems:
  - » Engine (gas and LPG1)
  - » Transmission (automatic)
  - » Heat / Ventilation / Air Conditioning
  - » Electrical
  - » Exhaust
  - » Engine Cooling
  - » Emissions
- Includes an ATech Fault / Simulator Panel with multiple faulting options / features
- Data link connector (DLC) for scan tool diagnostics
- Breakout box with test points for PCM pins
- Aids in developing real-world system skills and knowledge
- Performs actual service manual diagnostic procedures
- Powder-coated frame mounted on casters for ease of mobility



# Diesel Engine

## Medium / Heavy Truck

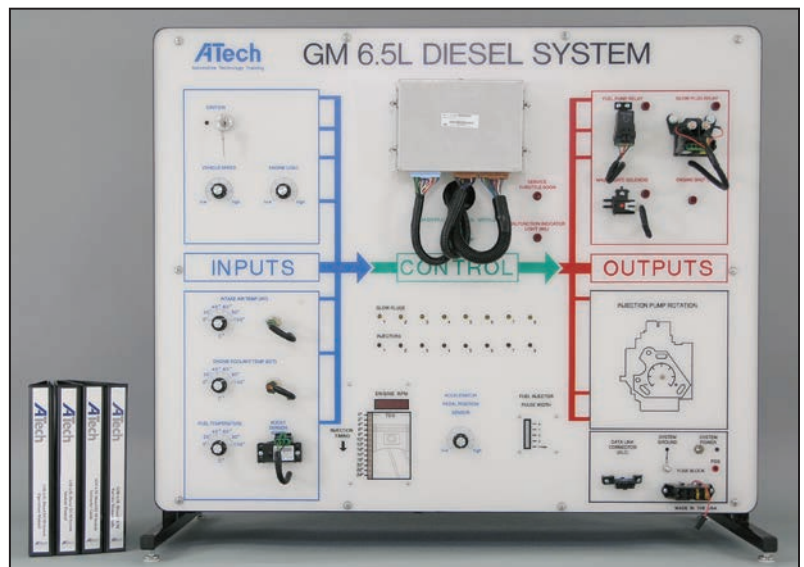
### GM 6.5L Diesel Injection Pump System model 6601



- Actual fuel injector pump operation
- Variable control of injection timing
- Variable control of engine load
- Visible individual fuel injector output
- Stanadyne rotary injection pump
- Allows for speeds from 0 to 2500 RPM
- Courseware included

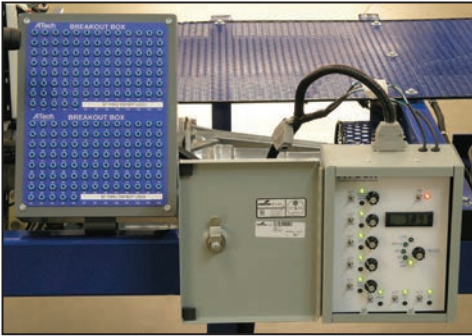
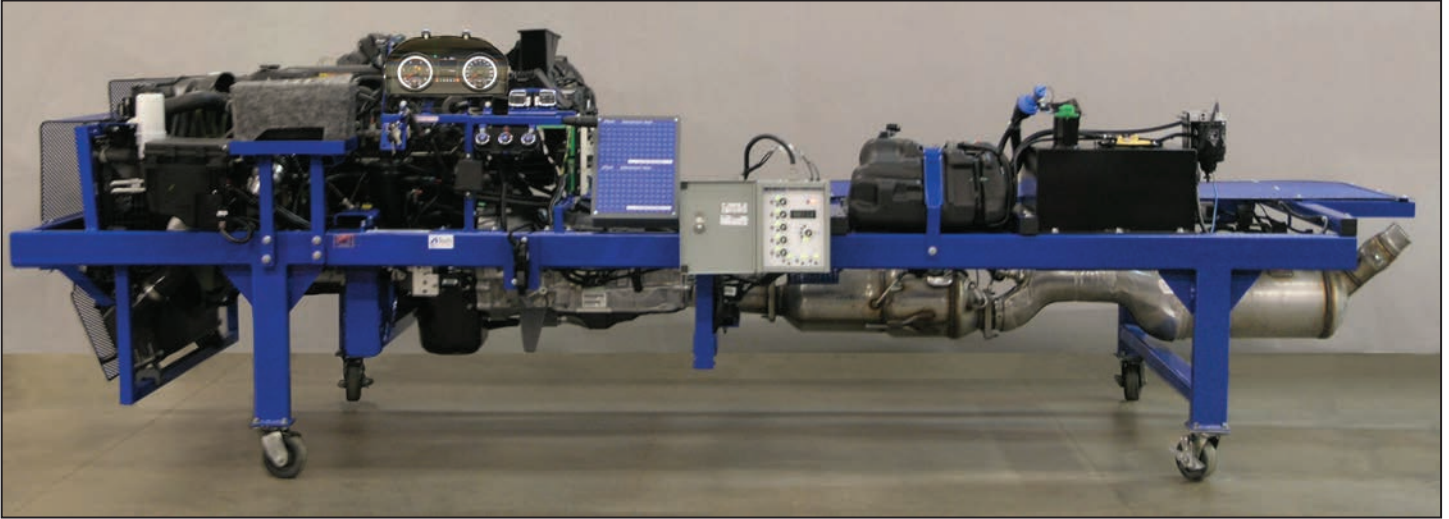
### GM 6.5L Diesel ECM System model 6611

- Injected fuel volume based on sensor inputs
- Variable control of engine RPM
- Variable control of engine Load
- Variable control of engine coolant temperature
- Variable control of engine air temperature
- Variable control of fuel temperature
- Visible bar graph display of fuel injection pulse width
- Visible bar graph display of fuel injection timing
- Performs pump TDC adjustment procedure
- Interaction with standard scan tools for DTCs and engine parameters
- Courseware included

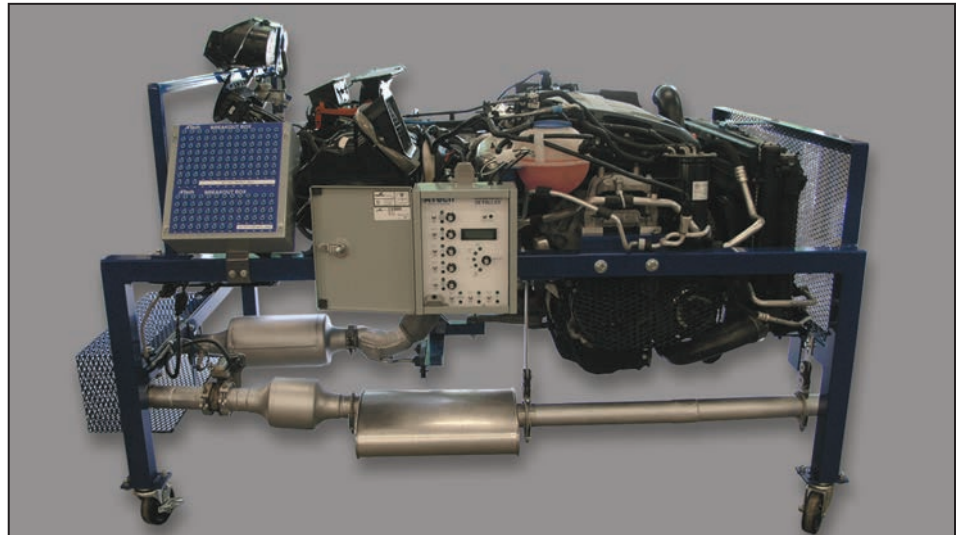


# Diesel Engine

## Diesel Engine Performance Trainer model 650D



Pictured Above: Cummins Engine,  
Right: Volkswagen Engine

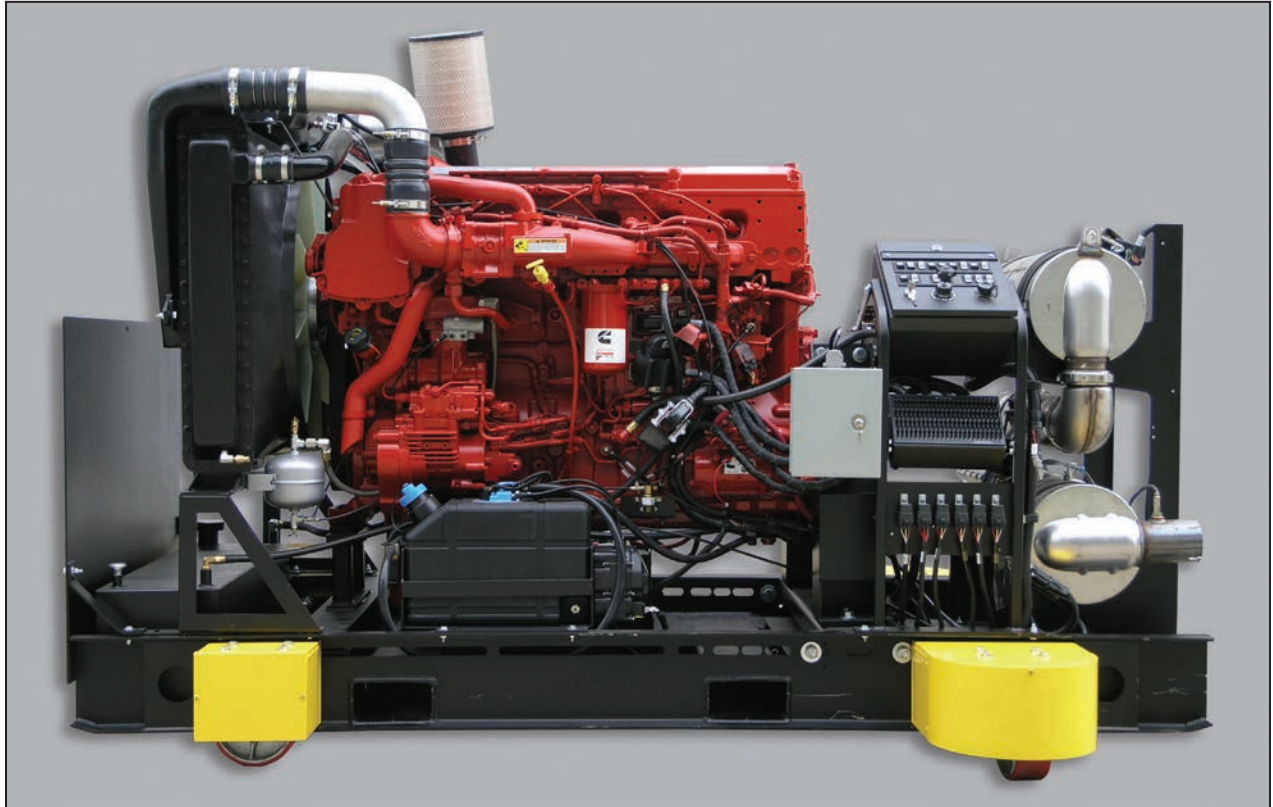


- New or remanufactured running engine
- Powder-coated frame
- Heavy duty casters
- Vibration control engine mounting
- Radiator cooling system with expansion tank
- Turbo intercooler
- Clutch drive fan with belt and pulleys
- Instrument panel
- Throttle control
- Diesel particulate filter (select models)
- Charging system
- Starting system
- Battery
- Fuel cell
- Electronic control module
- Electronic data link
- Urea SCR diesel exhaust fluid (select models)
- EGR (select models)
- Diesel oxidation catalyst (select models)

Contact ATech Training, Inc. for engine availability.

# Diesel Engine

## Diesel Engine Performance Trainer model 650HD



The Diesel Engine Performance Trainer (model 650HD) presents the live operation and study of a fully functional diesel engine. The trainer has a new diesel engine and components depending upon customer request. The trainer includes fuel, air handling control, cooling, and exhaust after treatment systems.

### Includes:

- High pressure common fuel rail engine
- Harness & batteries
- Instrument panel
- Fuel tank
- Electric fuel pump
- Fault insertion box
- Breakout box
- Diesel particulate filter (DPF)
- Selective catalytic reduction and dosing (SCR)
- Diesel oxidation catalyst (DOC)
- Exhaust gas recirculation (EGR)
- Variable geometry turbocharging (VGT)



# Diesel Engine

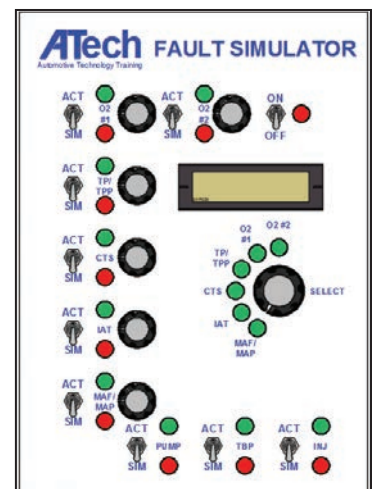
## Diesel Technology Trainer model 600D



The Diesel Technology Trainer (model 600D) presents the live operation and study of a late-model diesel pickup truck. It provides an advanced level of instruction by duplicating actual on-vehicle troubleshooting procedures. Requires 12VDC automotive batteries (included).

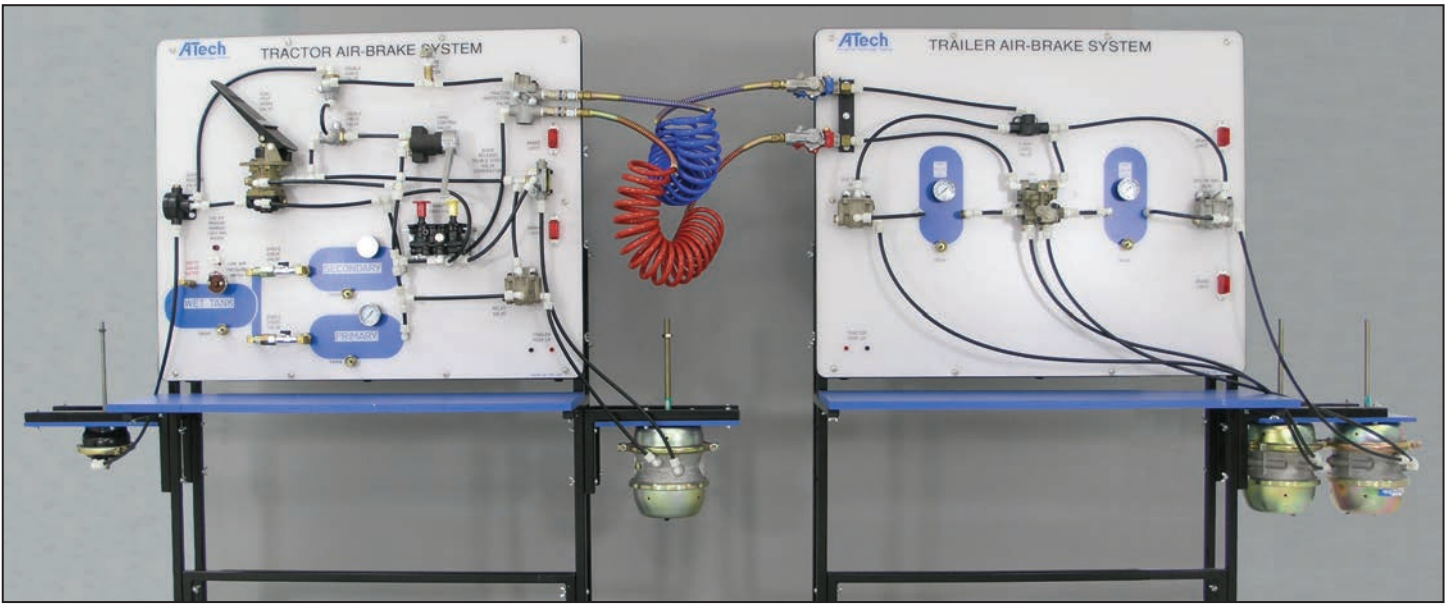
- Diesel particulate filter system (DPF)
- Has a fully functional engine, transmission, front brake system (rear lines are sealed), steering system, suspension system, fuel injection system, glow plug system, emission control, instrument panel, front and rear lighting system, and a air conditioning system
- ATech Fault / Simulator Panel for inserting realistic faults into the system
- Compatible with actual service manual test procedures
- Performs DPF regeneration with scan tool
- Portable via rolling casters
- Urea SCR diesel exhaust fluid (select models)
- EGR (select models)
- Diesel oxidation catalyst (select models)

Contact ATech Training, Inc. for engine availability.



# Brakes

## Medium / Heavy Truck



**Tractor (model 6410) and Trailer (model 6420) Air-Brake Systems**

### **Air-Brake Components Include:**

- Low Pressure Warning Light and Buzzer
- Safety Valve
- Single Check Valves
- Brake Light Switch
- Double Check Valve
- Control Valve
- Relay Valve
- Spring Brake
- Tractor Protection Valve
- Service and Emergency Glad Hands
- RT2 Valve
- Quick Release & Double Check Valve Combination
- Low Pressure Indicator Switch
- Drain Valves - Manual
- Air Gauge
- Quick Release Valve
- Dual System Foot Brake Valve
- Spring Brake Valve
- Hand Control Valve
- Service Brake Chamber
- Manifold Dash Valve
- RT4 Valve
- D.O.T. Air-Brake Lines

### **The ATech Air-Brake Training System allows System Demonstrations of:**

- Compressor Failure
- Secondary Tank Failure
- Park Brake Apply and Release
- Tractor to Trailer Hook-up
- Primary Tank Failure
- Normal Brake Operation
- Trailer Braking (Hand Control Valve)
- Trailer Air Supply and Evacuate

The ATech Air-Brake Training Systems are complete programs for presenting the real-world operation and study of Three Axle and Tractor / Trailer Air-Brake Systems. The trainers demonstrate FMVSS 121 Air-Brake Systems.

*\* Courseware included with models 6410 & 6430 only. See page 71.*

# Brakes

## Medium / Heavy Truck



**Air-Brake System 3 Axle  
model 6430**

The ATech Air-Brake Training System allows System Demonstrations of:

- Compressor Failure
- Primary Tank Failure
- Secondary Tank Failure
- Normal Brake Operation
- Park Brake Apply and Release

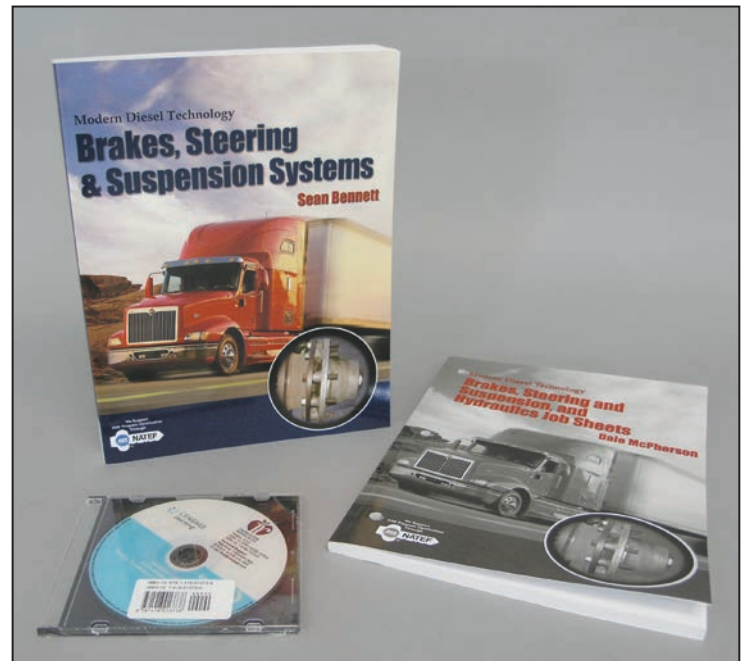
### Courseware Includes:

- Operations Manual
- Modern Diesel Technology - Brakes, Steering & Suspension Systems Manual
- Modern Diesel Technology - Brakes, Steering & Suspension and Hydraulics Job Sheets Manual
- USB Flash Drive Containing:
  - Instructor's Guide - Modern Diesel Technology: Brakes, Suspension & Steering Systems
  - Bendix Workbook - Air-Brake Systems Workbook
  - Handout - Bendix Air-Brake Systems Workbook
  - Troubleshooting Sheet
  - The Air-Brake Handbook

### Air-Brake Components:

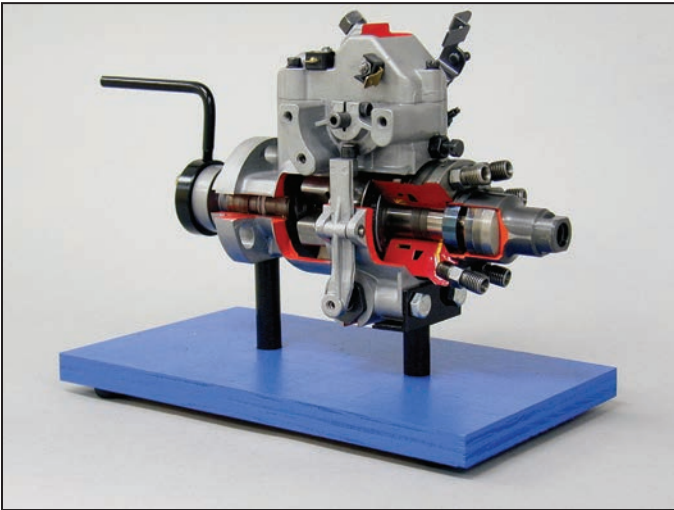
- Low Pressure Warning Light / Buzzer
- Low Pressure Indicator Switch
- Safety Valve
- Drain Valves - Manual
- Single Check Valves
- Air Gauge
- Brake Light Switch
- Quick Release Valve
- Double Check Valve
- Dual System Foot Brake Valve
- Control Valve
- Spring Brake Valve
- R12 Relay Valve
- R14 Relay Valve
- Spring Brake
- Service Brake Chamber

The Training System needs an external compressed air supply of 90 to 140 PSI and a standard 110 VAC electrical supply.

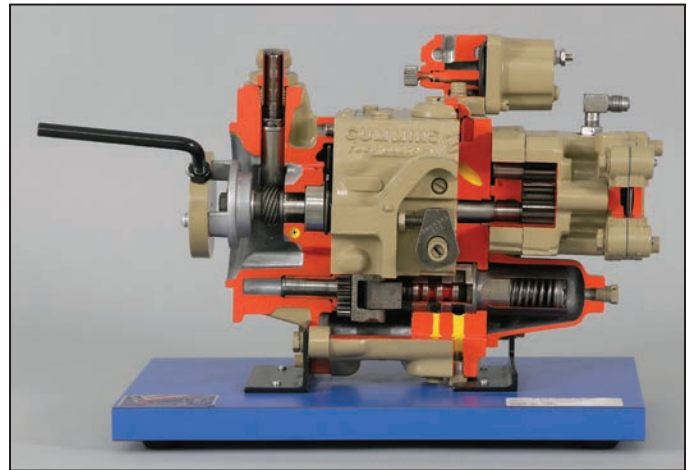


Air-Brake Training System Courseware  
\* Included with models 6410 & 6430 only

# Diesel Cutaways



**Stanadyne Diesel Pump  
model 6681**



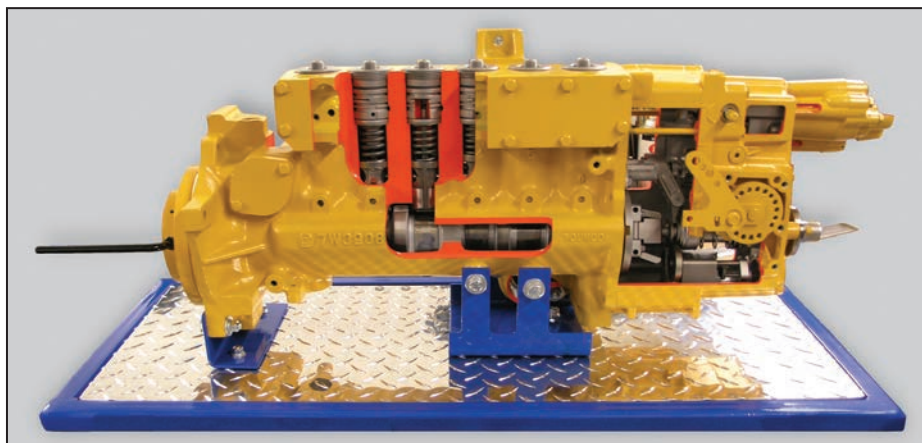
**Cummins PT Diesel Injector Pump  
model 6682**



**CAT 3208 Diesel Injection Pump  
model 6683**

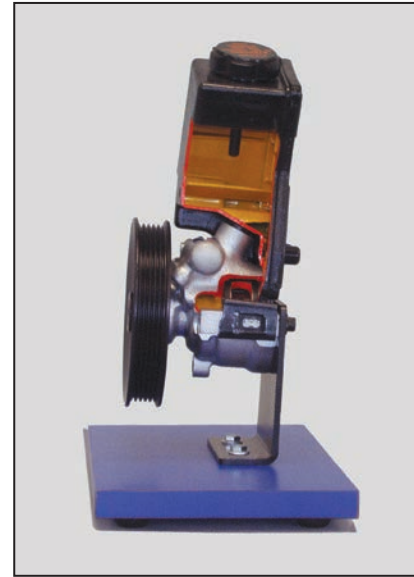
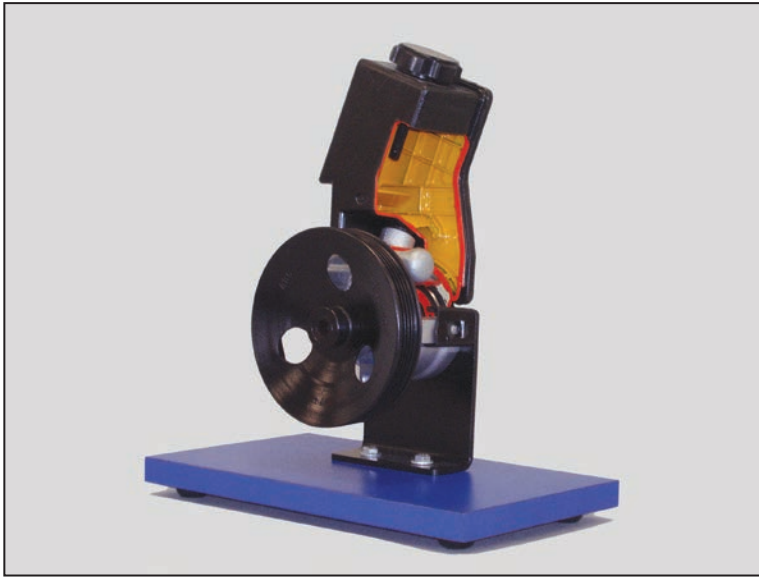


**CAT 3304B Diesel Injection Pump  
model 6684**



**CAT 3406B Diesel Injection Pump  
model 6685**

# Cutaways

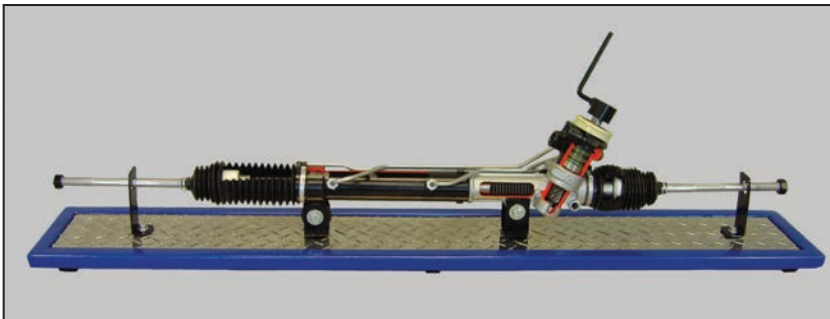


**Power Steering Pump Cutaway  
model 506**

The Power Steering Pump Cutaway (model 506) trainer is a cutaway of an actual power steering pump that shows internal components allowing for demonstration of pulley operation.

## Features:

- Late-model recycled power steering pump
- Hand crank
- Rotating power steering pump pulley
- Mounted on a laminate base



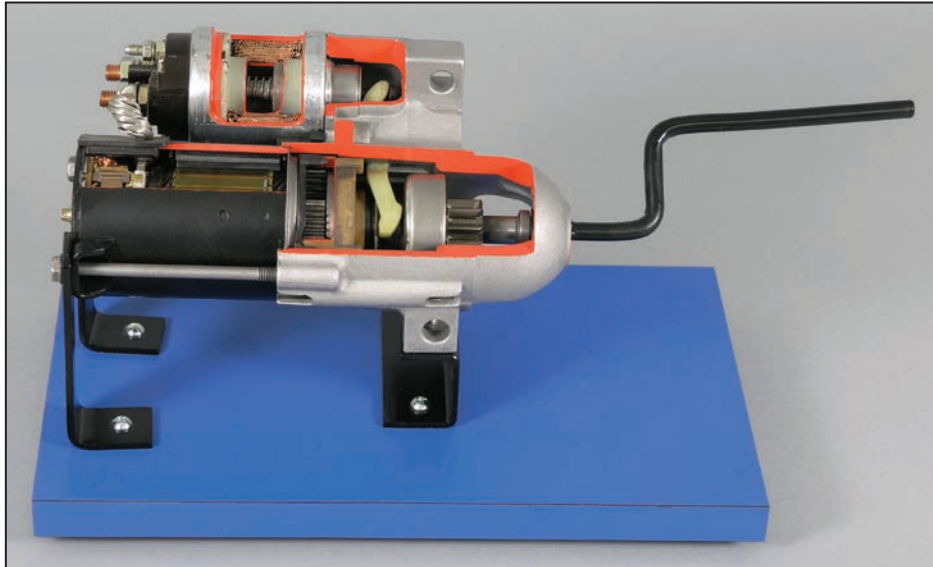
**Power Rack and Pinion Cutaway  
model 507**

The Power Rack and Pinion Cutaway (model 507) trainer is a cutaway of an actual power rack and pinion that shows internal components, allowing demonstration of internal components.

## Features:

- Late-model recycled power rack and pinion
- Hand crank
- Rotating steering gear
- Mounted on a diamond plate and powder-coated metal frame

# Cutaways

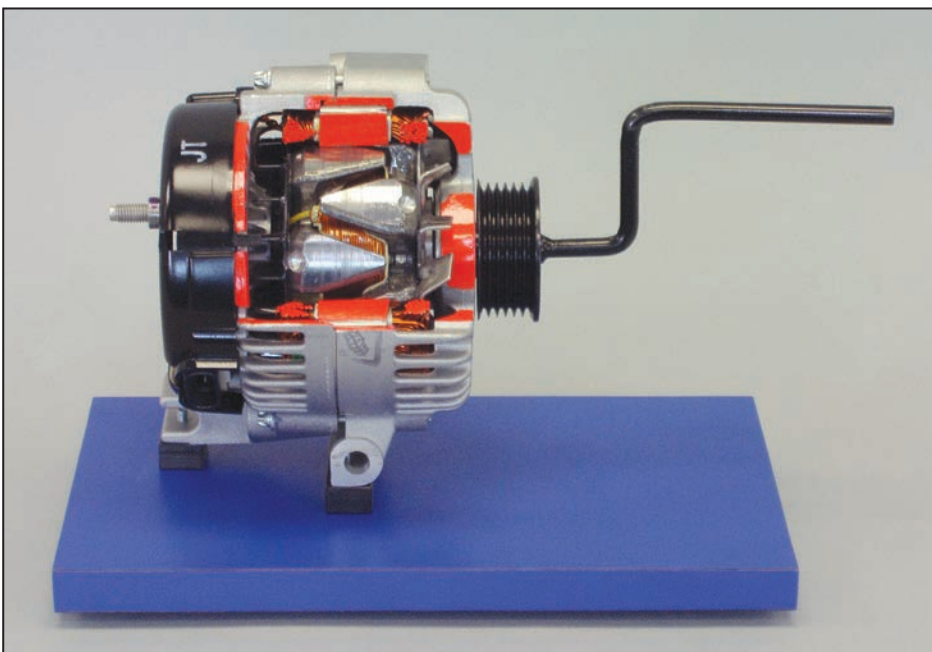


## Starter Cutaway model 813

The Starter Cutaway (model 813) trainer is a cutaway of an actual starter motor that shows internal components to demonstrate operation.

### Features:

- Late-model remanufactured General Motors starter
- Hand crank
- Rotating starter
- Mounted on a laminate base



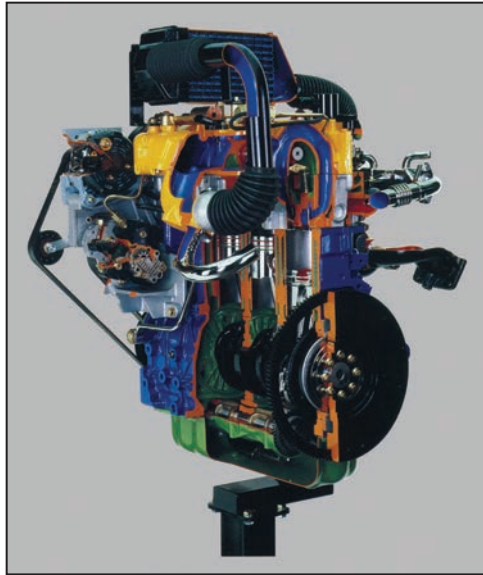
## Alternator Cutaway model 814

The Alternator Cutaway (model 814) is a cutaway of an actual alternator that shows internal components to demonstrate alternator operation.

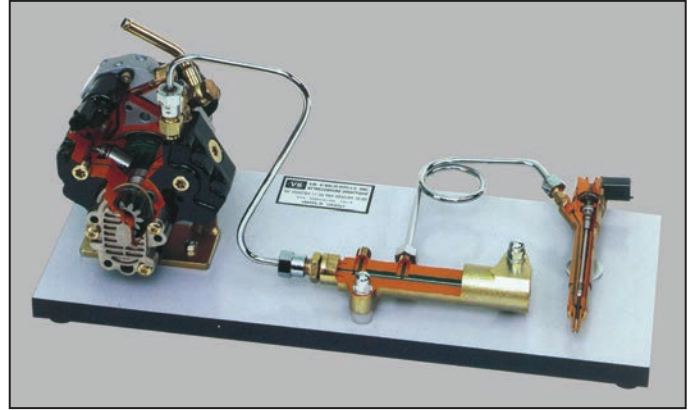
### Features:

- Late-model remanufactured General Motors alternator
- Hand crank
- Rotating alternator
- Mounted on a laminate base

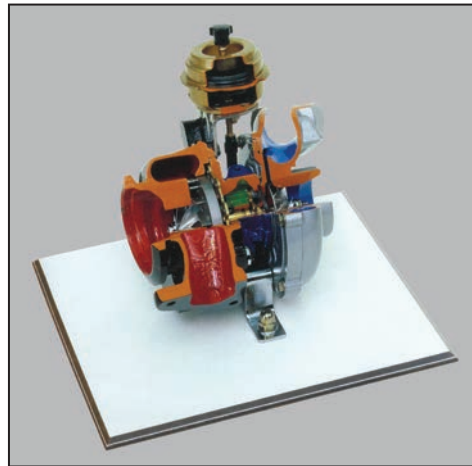
# Cutaways/Models



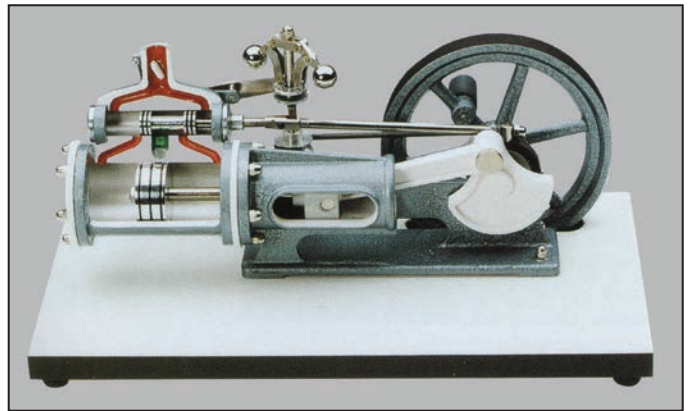
**16 Valve Jeep Turbo Diesel  
Common-rail Intercooler  
model 6010/6011**



**Diesel Common Rail  
model 10300**



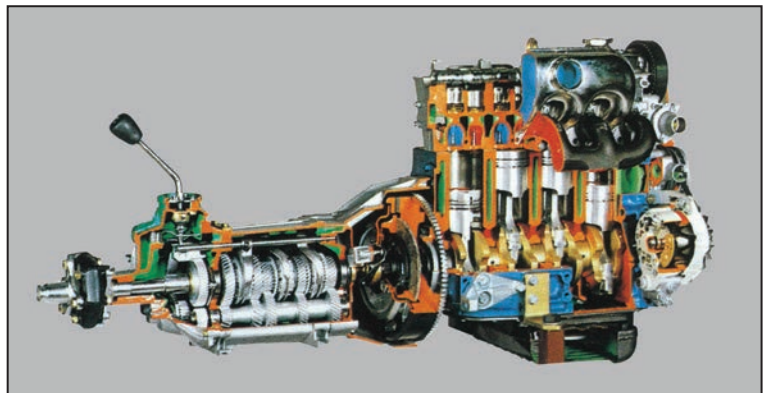
**Turbo  
model 10460**



**Steam Engine  
model VB 9220**



**Planetary Gear  
model ART 1069**



**4 Cylinder Fiat Diesel with Manual Transmission  
model 6040**

[Check for Availability and Pricing](#)

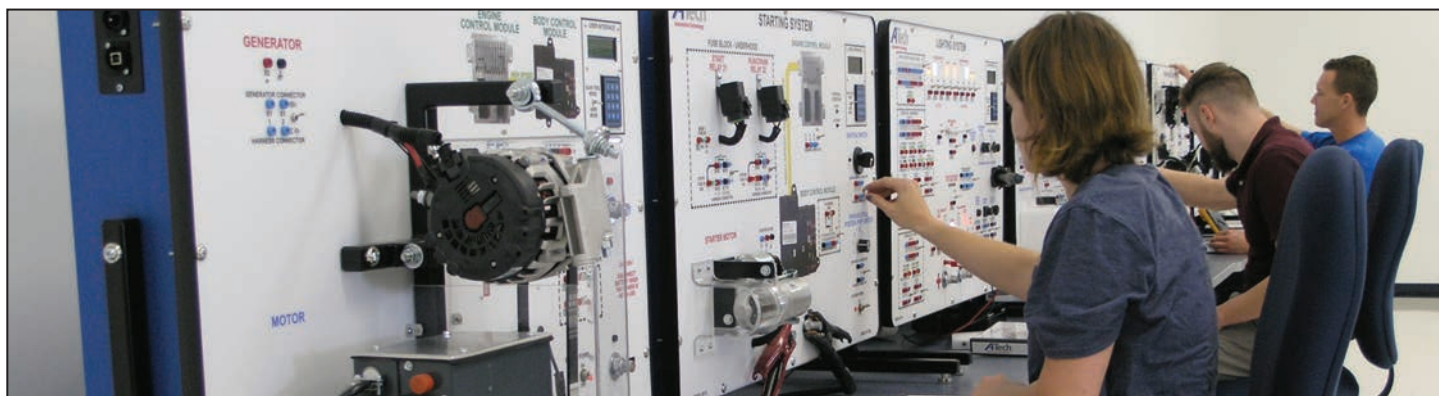
# Maintenance and Light Repair (MLR) Plan

	HOURS	WORKSTATIONS
Phase 1 Electrical / Electronics	120	20
Phase 2 Electrical / Electronics	150	12
Basic Brakes	70	1
Basic Engine Performance	65	12
Basic Suspension and Steering	75	1
Basic Heating and Air Conditioning	25	3
Engine Repair	120	2
<b>YEAR 1 TOTAL</b>	<b>625</b>	<b>51</b>
	HOURS	WORKSTATIONS
Advanced Brakes	40	1
Advanced Engine Performance - Powertrain Controls	40	1
Advanced Engine Performance - Emissions	140	2
Advanced Ignition	15	1
Advanced Suspension and Steering	25	1
Advanced Heating and Air Conditioning	70	1
Automatic Transmission and Transaxle	30	2
Manual Drive Train and Axles	70	3
<b>YEAR 2 TOTAL</b>	<b>430</b>	<b>12</b>
<b>Contact an ATech Representative for pricing and trainer breakdown - Plan Binders are available!</b>		
<b>TOTAL</b>	<b>1055</b>	<b>63</b>



# Automobile Service Technology (AST) / Master Automobile Service Technology (MAST) Plan

	HOURS	WORKSTATIONS
Phase 1 Electrical / Electronics	120	20
Phase 2 Electrical / Electronics	150	12
Basic Brakes	70	1
Basic Engine Performance	65	13
Basic Suspension and Steering	75	1
Basic Heating and Air Conditioning	25	3
Engine Repair	120	5
<b>YEAR 1 TOTAL</b>	<b>625</b>	<b>55</b>
	HOURS	WORKSTATIONS
Advanced Brakes	40	1
Advanced Engine Performance - Powertrain Controls	40	1
Advanced Engine Performance - Emissions	300	4
Advanced Ignition	30	2
Advanced Suspension and Steering	25	1
Advanced Heating and Air Conditioning	70	1
Automatic Transmission and Transaxle	70	4
Manual Drive Train and Axles	85	4
<b>YEAR 2 TOTAL</b>	<b>660</b>	<b>18</b>
<b>Contact an ATech Representative for pricing and trainer breakdown - Plan Binders are available!</b>		
<b>TOTAL</b>	<b>1285</b>	<b>73</b>



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