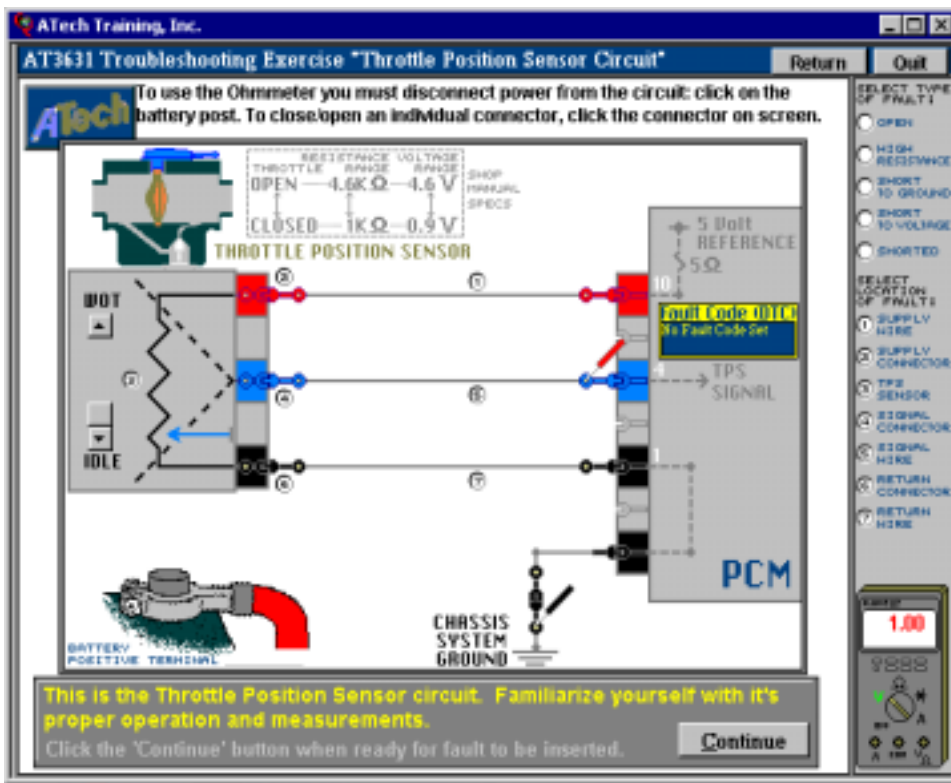


Computer Based Troubleshooting Skill Development For the Working Technician



Schematic Based Troubleshooting - Fig. 1

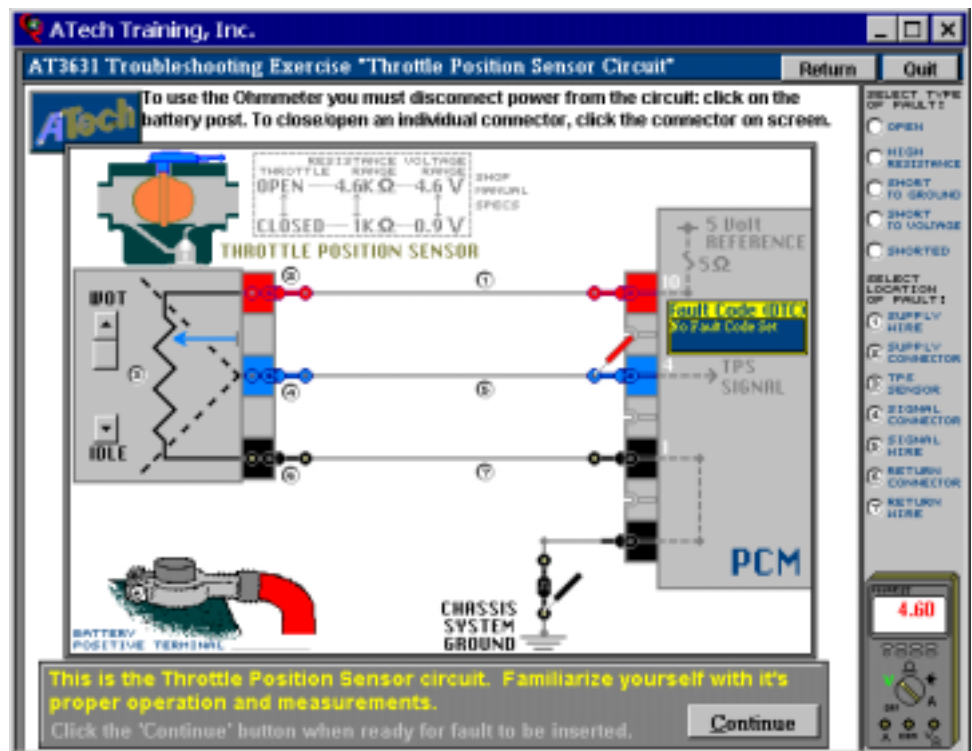
ATech Training Inc. introduces the new ATech 3631 software. Shop owners, techs, and service managers: you can now be in control of your own training program.

This is the first training system of its kind. You can learn how to do “Sensor End Diagnostics” and practice those hard to find engine control system problems. The ATech 3631 Engine Control System Troubleshooting program will allow you to insert electrical faults of all types in either a random mode or in a controlled mode.

The ATech 3631 trainer has a built in Digital Multimeter (DMM). There are 5 circuits to troubleshoot. The Fuel Pump Relay, Fuel Injector, Inlet Air Temperature

Sensor, Coolant Temperature Sensor and the Throttle Position Sensor are the circuits that are the hardest to diagnose. The ATech 3631 can insert more than 60 different faults across the 5 circuits. The faults cover the entire range of open circuits, shorts to power, shorts to ground, shorted components, and high resistance. There is almost no way to “bug” components, or vehicles to achieve this level of troubleshooting practice. But with the ATech 3631 you can put in all the “bugs” with just a click of the mouse. Figures 1 and 2 illustrate the level of interactivity incorporated into the program. As the Throttle Position Sensor slider is adjusted with the mouse, voltage (measured on the voltmeter) varies and the valve in the illustration of the

mechanical throttle changes to indicate throttle position. Shop Manual specifications are given for each

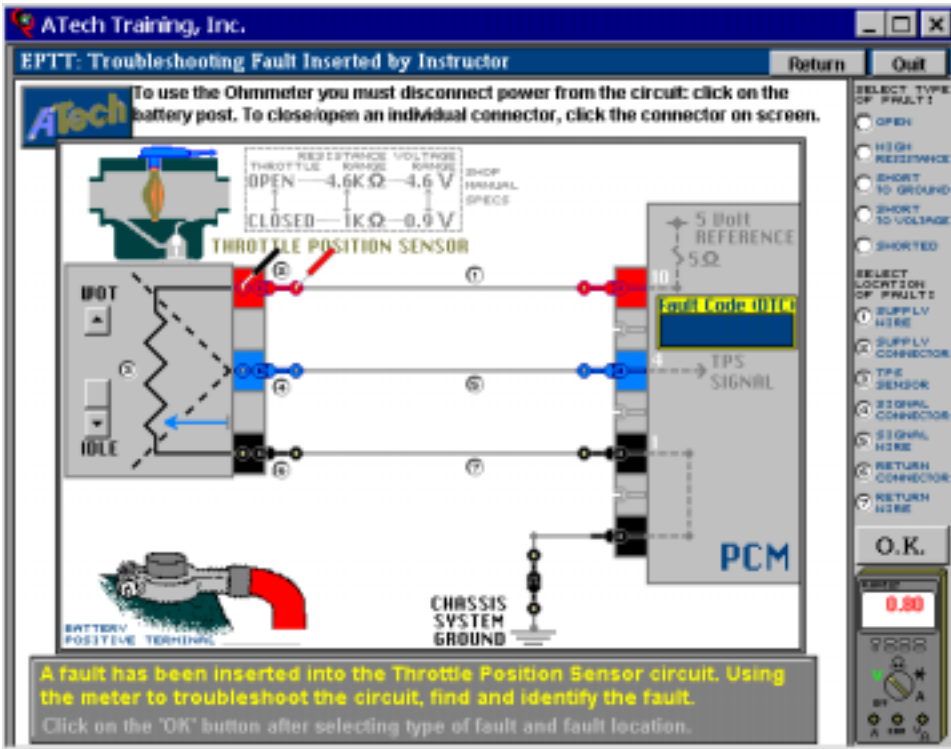


Interactive Features - Fig. 2

circuit in a portion of the schematic. These specifications typically give a normal range for voltages and

more realistic situation of only being able to back-probe connectors. If a probe is placed at a connection

point inside a component, the program will move it outside the component and give a warning message and distinctive sound indicating that the measurement point is not available. This is illustrated in Figure 4. The major problem with most Electrical/Electronic instruction is that most of the time is spent talking about theoretical issues such as complex series-parallel circuits and little if any time is given to either theoretical or practical troubleshooting skill development. As a result, students graduate from training programs with the ability to calculate circuit parameters using Ohm's Law but cannot find a simple open connection in a dome light circuit.



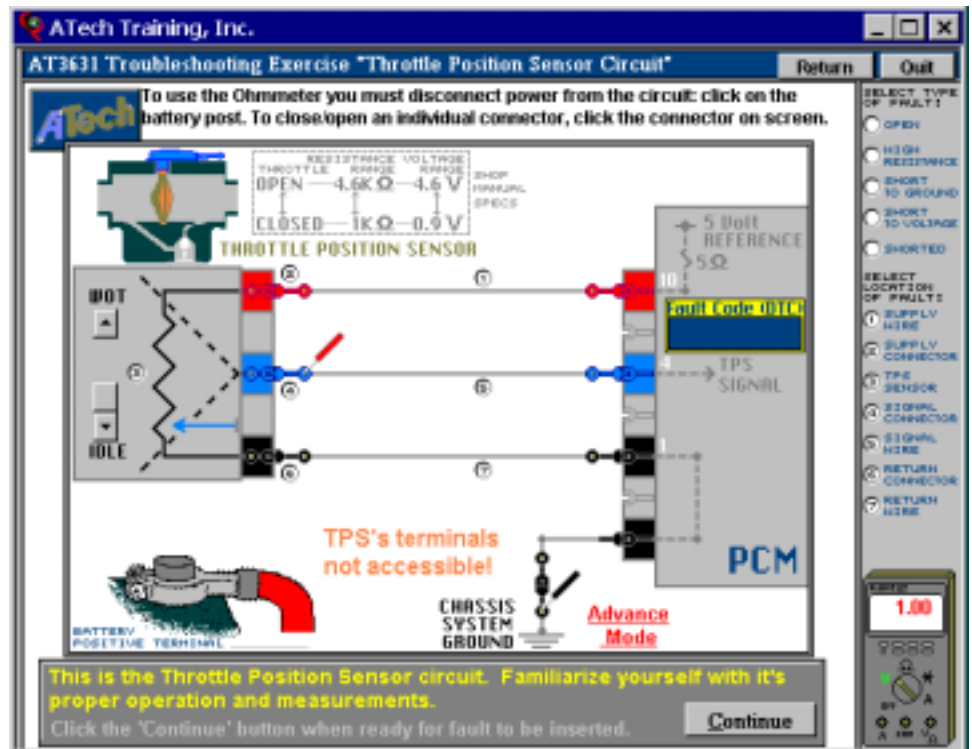
Training Mode - Fig. 3

resistances. In circuits that are temperature sensitive, a chart is given showing the temperature-resistance relationship along with the ambient temperature.

“We Learn What We Practice” is an idea that everyone can agree with. If we practice Ohm's Law, we learn Ohm's Law. But how does the student transition that knowledge to troubleshooting? They must be given the opportunity to practice and

The A Tech 3631 has two modes of operation - Training and Advanced. In the Training mode, measurements are allowed inside components. As illustrated in Figure 3, if a high resistance in a connection is given as a fault, the troubleshooter can measure directly across the connecting pin for both voltage drop and contact resistance. This mode was included in the program to make the transition to only being able to troubleshoot by back-probing easier. The Training mode permits a student to see and measure the effects on voltage and resistance of some of the typically “hidden” faults.

The Advanced mode creates the



Advanced Mode - Fig. 4

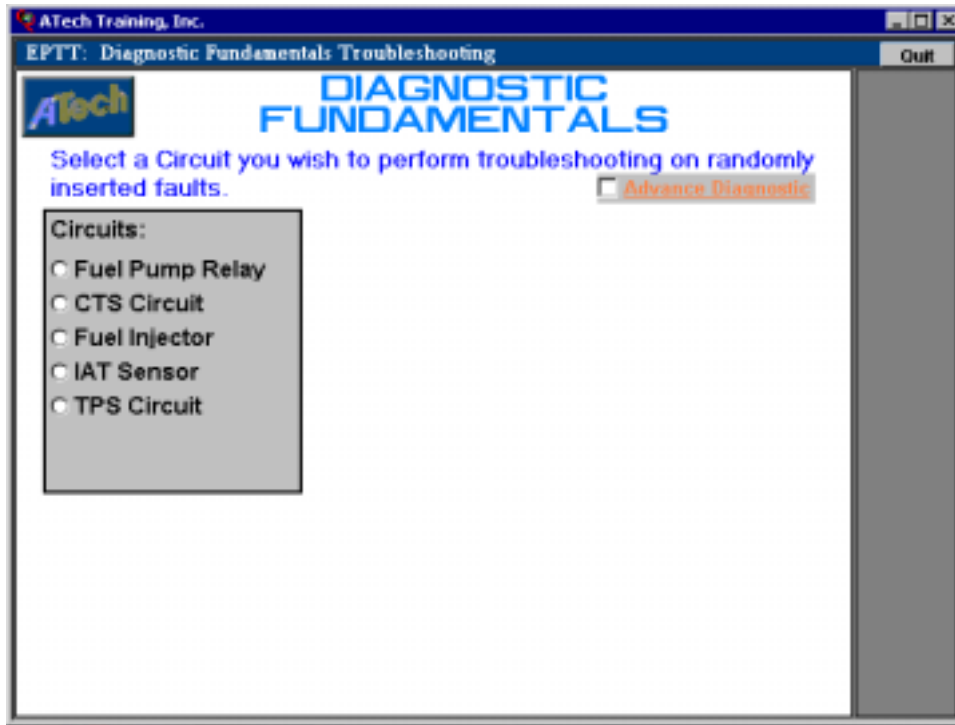
apply the concepts of Ohm's Law to faulted circuits. In other words, practice, practice, practice. The ATech 3631 is the vehicle for both beginners and advanced

the circuit and fault can be selected creating the level of complexity desired. This is also a good way to evaluate the troubleshooting skill level of a possible

new employee. As shown in the figure, a random fault insertion mode can also be selected. When in this mode, the software will continue to insert new faults at random into the selected circuit allowing hours of practice.

After an answer is selected and the okay button is clicked, the program will respond with either correct or incorrect and indicate the fault type and its location. This is shown in figure 7. The fault will remain active until the continue button is clicked. If an answer is incorrect, the instructor can then discuss with the student why their answer was incorrect and measure all of the circuit parameters with

the fault still present. Figure 8 illustrates that if a fault is given that would result in the fuse blowing, such as a short to ground of a supply wire, the fuse in the schematic will actually blow. In addition, DTCs will be shown in the scan tool readout

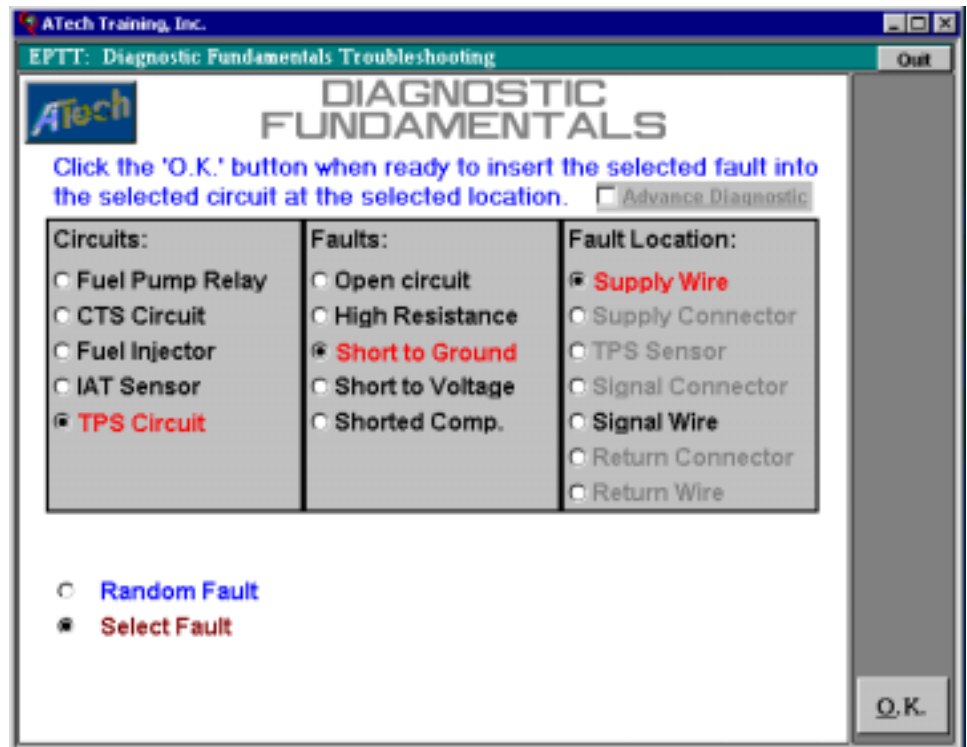


Circuit Selection - Fig. 5

technicians to practice using their electrical knowledge to troubleshoot actual engine control circuits. Every level of technician can dramatically improve their troubleshooting skills by utilization of the Training and then the Advanced mode of the ATech 3631.

Figure 5 illustrates the selection of circuits that are available in the ATech 3631. Each circuit contains an average of 12 faults. Some will have considerably more. For example, the Throttle Position Sensor circuit has 18 faults. Some are very difficult to troubleshoot and even "supertechs" will have problems. The Advanced mode is also selected on this screen.

Figure 6 shows the process of inserting a specific fault in a particular circuit. If the shop owner or instructor wants to present a challenge to a "hotrod" technician,

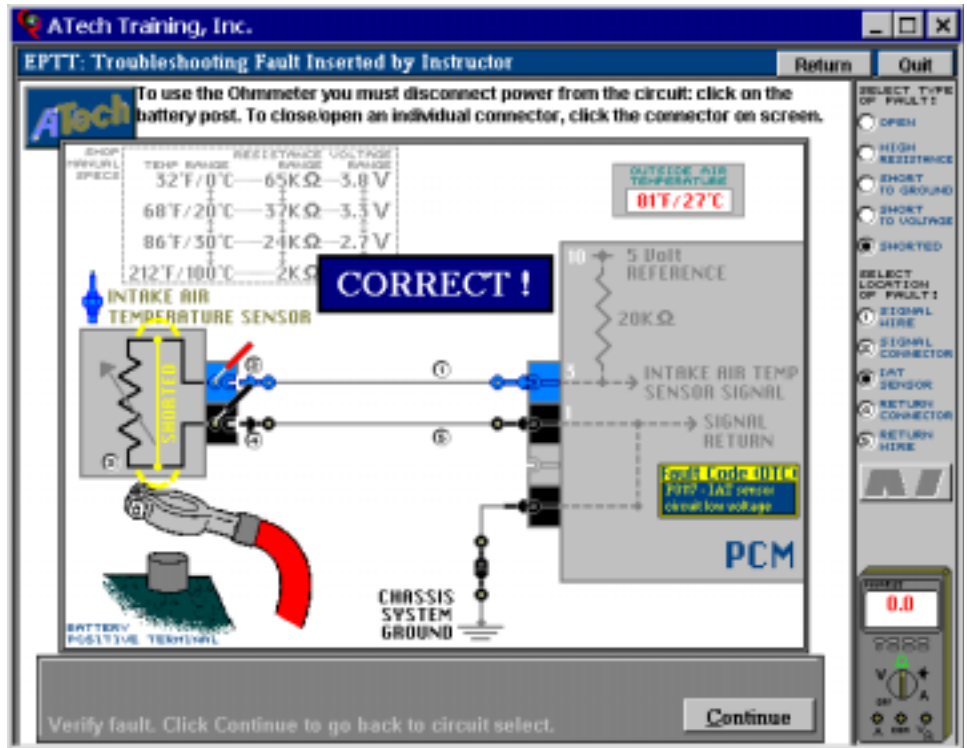


Fault Mode Selection - Fig. 6

box if they are applicable to the present fault. These DTCs are the same as would be displayed by any of the typical scan tools in present use.

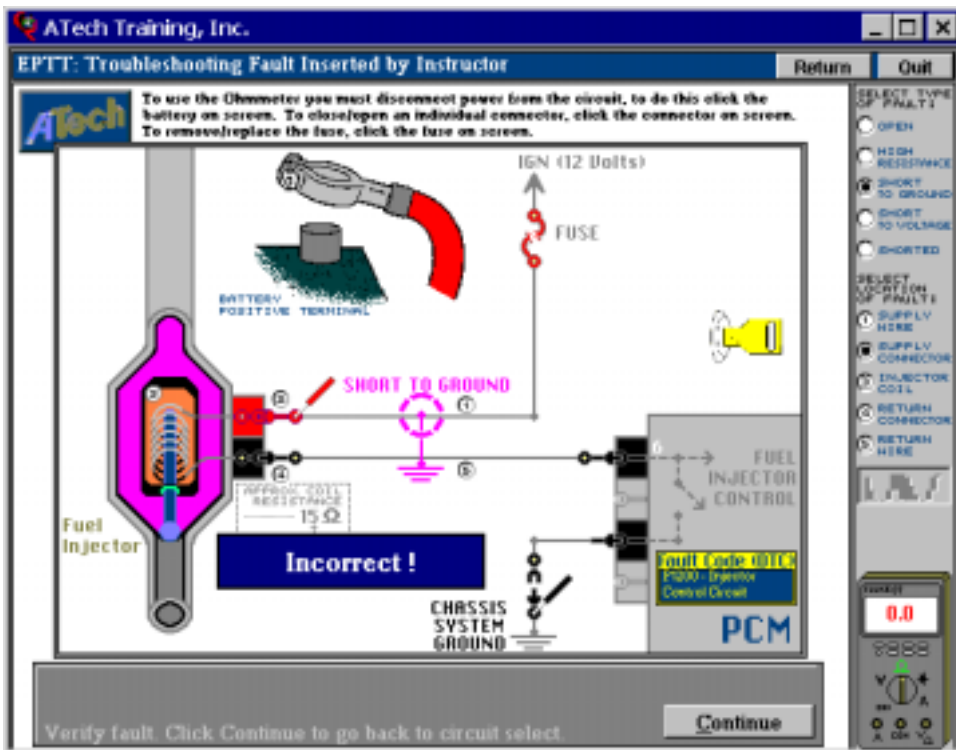
Whether you are just starting out in automotive service or are an old hand at it, you will find the ATech 3631 to be challenging. At the same time you will have fun trying to troubleshoot and understand all the possible problems. The ATech 3631 even has the ability to manually insert faults, with choices from an easy to use menu. You can challenge your co-workers and have a contest to find the faults the fastest.

You will learn to master the art of electrical troubleshooting using a built in DMM on realistic real world faults in the engine control system. You will learn Volt measurement, Resistance measurement and master Volt Drop testing of common engine control circuits. The ATech 3631 is a self paced, computer based, totally interac-



Fault illustrated after answer - Fig. 7

tive, hands on approach to learning. It requires a PC with a Pentium 100 or greater processor, Windows 98 or later operating system, 64 MB of ram, 10 MB of hard disk space available, a CD ROM drive, and VGA graphics or better.



Some faults blow fuses - Fig. 8

We all know that practice and repetition is how automotive technicians learn to master their skills. With the ATech 3631, you can practice as much as you want or need. There is nothing else available today at any price that will provide this much practice and repetition. You can learn to use the ATech 3631 in no time. The menu is easy to follow and very intuitive. The ATech 3631 can be used with other ATech products to reinforce troubleshooting techniques in other electrical systems of the automobile. It can be used alone or in a curriculum approach to your satisfy your training needs. **Demo available on the ATech website.**