

Modern Air and Fuel Strategies and Diagnostics **NEW – Available May 2025**

Course No: 7504

When you think about the components of modern-day automotive air and fuel control systems, what is the first thing that comes to mind? Today's vehicles are commonly equipped with turbochargers, direct fuel injection, variable valve timing, variable valve lift, wideband ratio sensor, etc., and the list goes on and on. So how do we make better sense of the operation strategies and develop a diagnostic plan for these modern challenges?

It is time to enter a new level of technician skills since today's vehicle technology changes have happened at such an accelerated rate. Whether we're diagnosing an airflow management problem or a fuel control issue, we need to know why the engine controller is making the decisions that it is. If a controller is receiving false input data, then the output decisions are going to be incorrect as well. That can be extremely challenging today given that there is an abundant amount of data parameters compared to years before. Thinking outside of the box should become a new normal, and our goal is to encourage the technician to look at these modern-day systems through fresh lenses and come up with new ways to diagnose correctly by getting a better understanding of system operation. Some of the techniques will include:

- Validate airflow measurement and control systems
- Utilize wideband AFR on nearly any vehicle
- Fuel sample testing
- Introduce analyzing engine programming maps
- Scrutinize engine system inputs
- Fault code setting criteria usage
- More areas to use a pressure transducer



Modern air and fuel control systems today are more complicated than in years past, so we need to be able to detect when a controller has switched to running in a default. This course is intended to help and encourage today's technicians to use every data parameter in their scan tool that is necessary when diagnosing either an airflow sensing/control problem or a fuel system concern. This course is intended for A and B level technicians.

Recommended for A and B level technicians.

- *Why would an ECM command additional fuel delivery to an overly rich system already?*
- *What effect does air humidity and barometric pressure have on engine running?*
- *How can I find intermittent fuel system issues?*
- *What is a programming map?*
- *How can I know if the vehicle's wideband and oxygen sensors are correct?*