Department of the Environment
Vehicle Emissions Inspection Program

Training Class Information

Three-Way Catalytic Converter, Oxygen Sensors and Fuel Trim Systems Operation, Fault Diagnosis & Repair Verification

Variable Valve Timing/Variable Cam Timing (VVT/VCT): Operation, Fault Diagnosis & Repair Verification (4hrs)

Location and Dates:- May 8th or 9th – 9:00 am – 5:00 pm- Lincoln College of Technology – Columbia

Course Description:

This course provides an overview of three-way converter (TWC) operation and details the monitoring requirements and strategies used by vehicle OEMs to determine TWC efficiency. Generic and manufacturer specific TWC DTCs along with diagnostic and repair verification procedures are identified for the Steady Cruise, Idle and Enleanment/Enrichment Oxygen Storage Capacity monitoring methods. Warranty coverage is discussed for California and federally certified vehicles. Use of vehicle OEM web available service information is also incorporated to help increase participant familiarization with EPA requirements for emissions related information availability and OEM compliance.

The Oxygen Sensors portion of the course discusses the different types of Exhaust Oxygen Sensors (EO2S or O2S) currently in use including the Critical Current and Ion Pump Air/Fuel (A/F) Ratio Sensors as well as the typical Stoichiometric O2S. Unique operating characteristics and circuit configurations of the different Air/Fuel Ratio Sensors are discussed. Use of Lambda values derived from scan data is also thoroughly detailed for enhanced understanding of diagnostic procedures related to A/F sensors. OBD regulations and vehicle OEM monitoring strategies for each type of O2S are detailed along with diagnostic and repair verification procedures. Use of vehicle OEM web available service information is also incorporated to help increase participant familiarization with EPA requirements for emissions related information availability and OEM compliance. The course will also discuss details of various fuel delivery system monitoring requirements and the strategies used by vehicle manufacturers to determine if the desired air/fuel ratio is being met. Rear Oxygen Sensor and Individual Cylinder Fuel Trim Systems are also detailed. Generic and manufacturer specific

Diagnostic Trouble Codes (DTCs) along with diagnostic and repair verification procedures are identified for the monitoring methods. Use of vehicle manufacturer web available service information is also incorporated to help increase diagnostic efficiency by familiarizing participants with common and unique features of manufacturer service procedures as well as website navigational characteristics. **(over for more information)**

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Course Focus:

- TWC Monitoring Requirements
  - TWC Monitoring Strategies and Operation
  - TWC DTCs and Operation
  - Scan Tool Retrieval of TWC Information using Service Modes $01, $02, $03 & $07, $06 (where available), and $09 (In-Use Performance)
- TWC Diagnosis and Repair Verification
- O2S Monitoring Requirements
  - O2S Systems, Monitoring Strategies and Operation
  - Critical Current and Ion Pump Air/Fuel Ratio Sensors, Monitoring Strategies and Operation
  - O2S DTCs and Operation
  - Scan Tool Retrieval of O2S Information using Service Modes $01, $02, $03 & $07, $05 & $06 (where available), and $09 (In-Use Performance)
- O2S Diagnosis and Repair Verification
- Fuel System Monitoring Requirements (factors determining system advancements), Strategies and Operation
- Fuel System DTCs and Operation
- Scan Tool Retrieval of Fuel System Information using Service Modes $01, $02, $03/$07/$0A, and $06
- Fuel System Diagnosis and Repair Verification

Please contact Margie Wise with MDE to register for this course. She may be reached at (410) 537-3197 or by e-mail mwise@mde.state.md.us. **Both of the training sessions will cover the same material**. For directions to the Lincoln College of Technology, 9325 Snowden River Parkway, Columbia, Md 21046 or call (410) 290-7100 or please visit the following website . Directions