

Basic Natural Gas Vehicle Training

Module 4: Introduction to Sensors and Actuators

Lesson 7: Fuel Injectors

Lecture: 20 Minutes

Lab: None

Classroom Instructional Objectives:

Upon completion of this unit of instruction the student will be able to:

- Explain how the power-train control module (PCM) driver energizes injectors.
- Explain the flow characteristics of various injector designs.
- Explain pulse width modulated injectors.
- Explain frequency modulated injectors.
- Analyze wiring diagram sections specific to fuel injectors.
- Explain how to test injectors for open and shorts.
- Explain how to measure injector on-time.

Key Classroom Objectives:

- Explain how PCM inputs determine injector on-time.
- Explain how the PCM controls injectors
- Explain the flow rate of various injector designs.
- Explain different control strategies for control of the injectors.
- Analyze wiring diagram sections specific to fuel injectors.
- Explain how to test injectors using a multi-meter.
- Explain how to test injector on-time using multi-meters.
- Stress the importance of correctly using a multi-meter
- Introduce the testing of injectors using a lab scope.

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Lab Skill Objectives:

Upon completion of this unit of instruction the student will be able to:

None

Key Lab Points:

None

Classroom Materials:

- Attendance sheet
- Power Point presentation CD
- Lap-top
- Projector
- Instructor's guide
- White board marking pens
- Projection screen

Handouts:

- Power Point slide materials

Instructor's notes:
