

Automotive Technology 6th Edition

Chapter 80 – Fuel-Injection Components and Operation

Lesson Plan



CHAPTER SUMMARY:

1. Electronic fuel-injection operation and speed-density fuel-injection systems
 2. Mass airflow fuel-injection systems, throttle-body injection, and port-fuel injection
 3. Fuel-pressure regulator, vacuum-biased fuel-pressure regulator, and electronic returnless fuel system
 4. Mechanical returnless fuel system, demand delivery system (DDS), and fuel injectors
 5. Central port injection, fuel-injection modes of operation, and idle control
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OBJECTIVES:

1. List components of electronic fuel-injection systems.
 2. Explain how air intake is measured in fuel-injection systems.
 3. Describe how throttle-body injection and port fuel-injection systems work.
 4. Discuss the function of the fuel-pressure regulator and describe a vacuum-biased fuel-pressure regulator.
 5. Describe returnless fuel systems.
 6. Describe how fuel injectors function and describe central port injection.
 7. Explain modes of fuel-injection system operation. Explain how idle speed is controlled.
 8. This chapter will help prepare for Engine Repair (A8) ASE certification test content area “C” (Fuel, Air Induction, and Exhaust Systems Diagnosis and Repair).
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RESOURCES: (All resources may be found at <http://www.jameshalderman.com>)

1. **Task Sheet ASE (A8-D-5) P-1, (A8-D-6) P-2:** Air Intake Inspection
 2. Chapter PowerPoint
 3. Chapter Crossword Puzzle and Word Search
 4. Animations: Electronic Fuel Injection - EFI 1, Electronic Fuel Injection - EFI 2, and Idle Air Control - IAC
 5. Videos: See list at the end of the lesson plan.
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ACTIVITIES:

1. **Task Sheet ASE (A8-D-5) P-1, (A8-D-6) P-2:** Have students complete Air Intake Inspection Task Sheet.
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ASSIGNMENTS:

1. Chapter crossword and word search puzzles.
 2. Complete end of chapter 10 question quiz.
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CLASS DISCUSSION:

1. Review and group discussion chapter [Frequently Asked Questions](#) and [Tech Tips](#) sections.
 2. Review and group discussion of the five (5) chapter [Review Questions](#).
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NOTES AND EVALUATION:

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Videos: (at <http://www.jameshalderman.com>)

- Fuel injector drivers (time 44:07)
- Fuel injector operation (time 2:48)
- Cold start valve (time 0:42)
- Fuel pump troubleshooting (time 5:09)
- Injector circuits and wiring diagram (time 4:49)
- Fuel pressure regulator (time 0:34)
- Throttle body injection (time 6:56)
- Returnless fuel system part 1 (time 22:35)
- Returnless fuel system part 2 (time 47:18)
- Fuel injection (time 30:49)
- How fuel injection works (time 4:23)
- Spider injectors (time 10:39)
- Fuel rail removal (time 7:15)
- Intake manifold runner control (time 12:04)
- Fuel injector (time 0:37)
- Idle air control valve (time 0:46)
- Fuel injection 3D animation (time 3:09)
- ECM circuit and wiring diagram (time 3:21)