

Automotive Technology 6th Edition

Chapter 83 – Fuel-Injection System Diagnosis and Service

Lesson Plan



CHAPTER SUMMARY:

1. Port fuel-injection pressure regulator diagnosis
 2. Diagnosing electronic fuel-injection problems using visual inspection
 3. Port fuel-injection system diagnosis, testing for injector pulse, and checking fuel-injection resistance
 4. Pressure-drop balance test, injector voltage drop test, and scope-testing fuel injectors
 5. Idle air speed control diagnosis, fuel injection service, and fuel-system scan tool diagnostics
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OBJECTIVES:

1. Describe how to test fuel injectors.
 2. Describe how to test for an injector pulse and check fuel-injector resistance.
 3. Describe tests for pressure-drop balance, injector voltage-drop, and scope-testing fuel injectors.
 4. Explain how to diagnose idle air speed control problems and fuel system problems.
 5. 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-B-5) P-1, (A8-D-8) P-1: Scan Tool Diagnosis
 2. Task Sheet ASE (A8-B-6) P-1: Fuel Trim Diagnosis
 3. Task Sheet ASE (A8-D-7) P-2: Fuel-Injection System Diagnosis
 4. Task Sheet ASE (A8-D-7) P-2: Injector Resistance Testing
 5. Task Sheet ASE (A8-D-7) P-2: Fuel Injector Balance Test
 6. Task Sheet ASE (A8-D-7) P-2: Injector Voltage Waveform Test
 7. Chapter PowerPoint
 8. Chapter Crossword Puzzle and Word Search
 9. Animations: Quick Check Injector Pulse, Quick Check Injector Volts, and Test Injector Resistance
 10. Videos: See list at the end of the lesson plan.
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ACTIVITIES:

1. Task Sheet ASE (A8-B-5) P-1, (A8-D-8) P-1: Have students complete Scan Tool Diagnosis Task Sheet.
 2. Task Sheet ASE (A8-B-6) P-1: Have students complete Fuel Trim Diagnosis Task Sheet.
 3. Task Sheet ASE (A8-D-7) P-2: Have students complete Fuel-Injection System Diagnosis Task Sheet.
 4. Task Sheet ASE (A8-D-7) P-2: Have students complete Injector Resistance Testing Task Sheet.
 5. Task Sheet ASE (A8-D-7) P-2: Have students complete Fuel Injector Balance Test Task Sheet.
 6. Task Sheet ASE (A8-D-7) P-2: Have students complete Injector Voltage Waveform Test 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:



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

Injector balance (time 13:29)	Fuel pressure test (time 4:12)
Returnless fuel system part 1 (time 22:35)	Fuel pressure regulator (time 6:42)
Returnless fuel system part 2 (time 47:18)	GM fuel pressure sensor test (time 25:20)
Fuel injection (time 30:49)	Fuel system diagnosis (time 9:36)
Spider injectors (time 10:39)	Injector balance (time 13:29)
Fuel rail removal (time 7:15)	Crank no start (time 6:15)
Fuel injector replacement (time 3:21)	Drivability (time 21:31)
Fuel pump circuit access (time 5:58)	Fuel injector drivers (time 44:07)
2005 Neon injector problem (time 10:41)	PCM driver testing part 1 (time 3:11)
Noid light testing (time 30:44)	PCM driver testing part 2 (time 3:10)
Stuck closed fuel injector (time 11:34)	Scoping out drivability (time 12:05)
GM shorted injector (time 14:42)	Throttle body cleaning (time 3:38)
Injector Waveform analysis (time 6:53)	Throttle body cleaning (time 6:55)
Fuel system cleaning (time 8:16)	Throttle body cleaning (time 2:34)
Fuel system diagnosis (time 7:28)	Clean an IAC valve (time 2:39)
Fuel system diagnostic tips (time 9:36)	