

Advanced Engine Performance Diagnosis 8th Edition

Chapter 27 – Emission Control Devices Operation and Diagnosis

Lesson Plan



CHAPTER SUMMARY:

1. Purpose of Emission Control Devices, Smog, and Exhaust Gas Recirculation Systems
 2. OBD-II EGR Monitoring Strategies, Diagnosing a Defective EGR System, and Crankcase Ventilation
 3. PCV System Diagnosis, Secondary Air-Injection System, and Secondary Air-Injection System Diagnosis
 4. Catalytic Converters, Evaporative Emission Control System, and Leak Detection: Pump System
 5. Diagnosing the EVAP System
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OBJECTIVES:

1. Describe the purpose of emission control devices.
 2. Explain how smog is created.
 3. Explain exhaust gas recirculation systems.
 4. Discuss OBD-II monitoring strategies, diagnosing a defective -at system, and -at trouble codes.
 5. Explain how a defective -at system is diagnosed.
 6. Discuss crankcase ventilation, O e system diagnosis, and O e-related trouble codes.
 7. Explain how to diagnose the O e system.
 8. Explain the secondary air-injection system and its diagnosis.
 9. Describe the process for diagnosing a secondary air-injection system.
 10. Explain the purpose and function of catalytic converters, their diagnosis, and guidelines to replace them.
 11. Explain how to diagnose a catalytic converter.
 12. Explain evaporative emission control system, and compare enhanced and nonenhanced evaporative control systems.
 13. Discuss the leak detection pump system and onboard refueling vapor recovery.
 14. Discuss the diagnosis of the EVAP system and state inspection EVAP tests.
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RESOURCES: (All resources may be found at jameshalderman.com)

1. Task Sheet: Exhaust System Backpressure Test
 2. Task Sheet: PCV System Inspection
 3. Task Sheet: EGR System Scan Tool Diagnosis
 4. Task Sheet: Service EGR System
 5. Task Sheet: EGR Electrical Sensors
 6. Task Sheet: Catalytic Converter Test
 7. Task Sheet: Secondary Air Injection Diagnosis
 8. Task Sheet: Evaporative Emission Controls Diagnosis
 9. Task Sheet: Smoke Test of the EVAP System
 10. Chapter PowerPoint
 11. Crossword and Word Search Puzzles
 12. Videos: (A8) Emission Control Systems Diagnosis and Repair
 13. Animations: (A8) Emission Control Systems Diagnosis and Repair
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ACTIVITIES:

1. Task Sheet: Exhaust System Backpressure Test
 2. Task Sheet: PCV System Inspection
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 5. Task Sheet: EGR Electrical Sensors
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 9. Task Sheet: Smoke Test of the EVAP System
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ASSIGNMENTS:

1. Chapter crossword and word search puzzles from the website.
 2. Complete end of chapter quiz from the textbook.
 3. Complete multiple choice and short answer quizzes downloaded from the website.
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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: