

Advanced Engine Performance Diagnosis 7th Edition

Chapter 27 – Emission Control Devices Operation and Diagnosis

Lesson Plan



CHAPTER SUMMARY:

1. Smog, Exhaust Gas Recirculation Systems, and OBD II EGR Monitoring Strategies
2. Diagnosing A Defective EGR System, and EGR-Related OBD II Diagnostic Trouble Codes
3. Crankcase Ventilation, PCV System Diagnosis, and PCV-Related Diagnostic Trouble Code
4. Secondary Air-Injection System and Secondary Air-Injection System Diagnosis
5. SAI-Related Diagnostic Trouble Code and Catalytic Converters
6. Diagnosing Catalytic Converters and Catalytic Converter Replacement Guidelines
7. Catalytic Converter Related Diagnostic Trouble Code and Evaporative Emission Control System
8. Nonenhanced Evaporative Control System and Enhanced Evaporative Control System
9. Leak Detection, Onboard Refueling Vapor Recovery, and State Inspection EVAP Tests
10. Diagnosing the EVAP System, Evaporative System Monitor, and Typical EVAP Monitor
11. EVAP System Related Diagnostic Trouble Codes

OBJECTIVES:



1. Explain exhaust gas recirculation systems.
2. Discuss OBD-II EGR monitoring strategies, diagnosing a defective EGR system, and EGR trouble codes.
3. Discuss crankcase ventilation, PCV system diagnosis, and PCV-related trouble codes.
4. Explain the secondary air-injection system and its diagnosis.
5. Explain the purpose and function of catalytic converters, their diagnosis, and guidelines to replace them.
6. Explain evaporative emission control system, and compare enhanced and nonenhanced evaporative control systems.
7. Discuss the leak detection pump system and onboard refueling vapor recovery.
8. Discuss the diagnosis of the EVAP system and state inspection EVAP tests.
9. Describe evaporative system monitors and typical EVAP monitors.

RESOURCES: ([All resources may be found at jameshalderman.com](http://www.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 \(A8\)](#)
 12. [Videos: \(A8\) Engine Performance](#)
 13. [Animations: \(A8\) Engine Performance](#)
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ACTIVITIES:

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
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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
