

Automotive Engines Theory and Servicing 10th Edition

Chapter 18 – Emission Control Devices Operation and Diagnosis

Lesson Plan



CHAPTER SUMMARY:

1. Smog, Exhaust Gas Recirculation System, 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, Catalytic Converters, and Diagnosing Catalytic Converters
6. Catalytic Converter Replacement Guidelines and Catalytic Converter Related Diagnostic Trouble Code
7. Evaporative Emission Control System and Nonenhanced Evaporative Control System
8. Enhanced Evaporative Control System and Leak Detection Pump System
9. Onboard Refueling Vapor Recovery, State Inspection EVAP Test, and Diagnosing the EVAP System
10. Evaporative System Monitor, Typical EVAP Monitor, and EVAP System Related DTCs

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 evaporative control systems 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: Emission Control Devices Information
2. Chapter PowerPoint
3. [Crossword Puzzle and Word Search \(A1\)](#)
4. [Crossword Puzzle and Word Search \(A8\)](#)
5. [Videos: \(A1\) Engine Repair](#)
6. [Videos: \(A8\) Engine Performance](#)
7. [Animations: \(A1\) Engine Repair](#)
8. [Animations: \(A8\) Engine Performance](#)

ACTIVITIES:



1. Task Sheet: Emission Control Devices Information

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:
