

Automotive Engines Theory and Servicing 10th Edition

Chapter 21 – Engine Condition Diagnosis

Lesson Plan



CHAPTER SUMMARY:

1. Typical Engine Related Complaints, Engine Smoke Diagnosis, and The Driver IS Your Best Resource
2. Visual Checks, Engine Noise Diagnosis, Oil Pressure Testing, and Oil Pressure Warning Lamp
3. Cylinder Contribution Test, Relative Compression Test, and Compression Test
4. Wet Compression Test, Running (Dynamic) Compression Test, and Cylinder Leakage Test
5. Cylinder Power Balance Test, Vacuum Tests, and Exhaust Restriction Test
6. Diagnosing Head Gasket Failure and Dash Warning Lights,

OBJECTIVES:



1. Discuss typical engine-related complaints and engine smoke diagnosis.
2. Discuss the importance of the driver's description and visual checks.
3. Discuss engine noise diagnosis.
4. Explain oil pressure testing and the purpose of oil pressure warning lamps.
5. Explain compression testing, and compare wet and running compression tests.
6. Describe cylinder leakage test and cylinder power balance test.
7. Explain the vacuum test and exhaust restriction test.
8. Explain how to test back pressure with a vacuum gauge and a pressure gauge, and how to diagnose head gasket failure.
9. Discuss the operation of dash warning lights.

RESOURCES: ([All resources may be found at jameshalderman.com](http://www.jameshalderman.com))



1. Task Sheet: Retrieving OBDII Fault Code Information
2. Task Sheet: Cooling System Tests
3. Task Sheet: Variable Valve Timing System Diagnosis
4. Task Sheet: Verify Proper Idle Speed
5. Task Sheet: Cylinder Power Balance Test
6. Task Sheet: Compression Testing
7. Task Sheet: Cylinder Leakage Testing
8. Chapter PowerPoint
9. [Crossword Puzzle and Word Search \(A8\)](#)
10. [Videos: \(A8\) Engine Performance](#)
11. [Animations: \(A8\) Engine Performance](#)

ACTIVITIES:



1. Task Sheet: Retrieving OBDII Fault Code Information
 2. Task Sheet: Cooling System Tests
 3. Task Sheet: Variable Valve Timing System Diagnosis
 4. Task Sheet: Verify Proper Idle Speed
 5. Task Sheet: Cylinder Power Balance Test
 6. Task Sheet: Compression Testing
 7. Task Sheet: Cylinder Leakage Testing
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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: