

# Advanced Engine Performance Diagnosis 8<sup>th</sup> Edition

## Chapter 14 – Engine and Misfire Diagnosis

### Lesson Plan



#### **CHAPTER SUMMARY:**

1. Engine Related Complaints, Engine Smoke Diagnosis, Visual Checks, and Engine Noise Diagnosis
  2. Oil Pressure Testing, Misfire Diagnosis, Engine Related Misfire Diagnosis, and Compression Test
  3. Cylinder Leakage Test, Vacuum Test, Vacuum Waveforms, and Exhaust Backpressure Testing
  4. Diagnosing Head Gasket Failure
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#### **OBJECTIVES:**

1. List typical engine mechanical-related complaints.
  2. Discuss how to diagnose engine operation problems using visual checks, engine noise, engine smoke, and oil pressure testing.
  3. Describe how to perform visual inspections.
  4. Explain how to perform engine noise diagnosis.
  5. Explain how to perform an oil pressure test.
  6. List the possible causes of an engine misfire.
  7. Describe how to perform a cylinder power balance, cylinder contribution test, and cylinder pressure testing.
  8. Describe how to perform dry, wet, and running compression tests.
  9. Explain how to perform a cylinder leakage test.
  10. Discuss vacuum testing to determine engine condition.
  11. Explain how to interpret vacuum waveforms.
  12. Describe how to test for excessive exhaust system back pressure.
  13. Explain how to diagnose head gasket failure.
  14. Describe how to diagnose a head gasket failure.
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#### **RESOURCES:** (All resources may be found at [jameshalderman.com](http://jameshalderman.com))

1. Task Sheet: Engine Diagnosis
  2. Task Sheet: Exhaust Gas Analysis
  3. Task Sheet: Engine Problem Analysis
  4. Task Sheet: Cylinder Power Balance Tests
  5. Task Sheet: Compression Testing
  6. Task Sheet: Cylinder Leakage Test
  7. Task Sheet: Exhaust System Smoke Test
  8. Task Sheet: Engine Noise and Vibration Diagnosis
  9. Chapter PowerPoint
  10. Crossword and Word Search Puzzles
  11. Videos: (A8) General Engine Diagnosis
  12. Animations: (A8) General Engine Diagnosis
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#### **ACTIVITIES:**

1. Task Sheet: Engine Diagnosis
  2. Task Sheet: Exhaust Gas Analysis
  3. Task Sheet: Engine Problem Analysis
  4. Task Sheet: Cylinder Power Balance Tests
  5. Task Sheet: Compression Testing
  6. Task Sheet: Cylinder Leakage Test
  7. Task Sheet: Exhaust System Smoke Test
  8. Task Sheet: Engine Noise and Vibration Diagnosis
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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:**