

# Automotive Technology 6<sup>th</sup> Edition

## Chapter 78 – Oxygen Sensors

### Lesson Plan



#### **CHAPTER SUMMARY:**

1. Oxygen sensors, titania oxygen sensors, and PCM uses of the oxygen sensor
  2. Oxygen sensor diagnosis and post catalytic converter oxygen sensor testing
  3. Wide-band oxygen sensors, dual-cell planar wide-band sensor operation, and dual-cell diagnosis
  4. Single-cell wide-band oxygen sensors, wide-band oxygen pattern failures, and oxygen sensor DTC's
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#### **OBJECTIVES:**

1. Discuss how O2S sensors work and describe the types of O2S sensors.
  2. Discuss the PCM uses for the O2S sensor.
  3. List the methods that can be used to test oxygen sensor.
  4. Describe the symptoms of a failed O2S sensor.
  5. Describe testing on a post catalytic converter O2S sensor.
  6. Explain the operation of wide-band oxygen sensors.
  7. Compare dual cell wide-band sensors to single cell wide-band sensors.
  8. Describe wide-band oxygen pattern failures.
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#### **RESOURCES:** (All resources may be found

1. **Task Sheet ASE (A8-A-9) P-2:** Oxygen Sensor Diagnosis
  2. **Task Sheet ASE(A8-A-9) P-2:** Wide-Band Oxygen Sensor
  3. Chapter PowerPoint
  4. Chapter Crossword Puzzle and Word Search
  5. Animations: O2 Sensor Volt Check, O2 Sensor Volt Check, and Wide Band O2 Sensor
  6. Videos: See list at the end of the lesson plan.
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#### **ACTIVITIES:**

1. **Task Sheet ASE (A8-A-9) P-2:** Have students complete Oxygen Sensor Diagnosis Task Sheet.
  2. **Task Sheet ASE (A8-A-9) P-2:** Have students complete Wide-Band Oxygen Sensor Task Sheet.
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#### **ASSIGNMENTS:**

1. Chapter crossword and word search puzzles.
  2. Complete end of chapter 10 question quiz.
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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:**

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**Videos:** (at <http://www.jameshalderman.com>)

- Oxygen sensors (time 0:39)
- O2 sensor testing (time 6:56)
- Oxygen sensor BMW Mini (time 4:16)
- Front oxygen sensor removal (time 4:20)
- Oxygen sensor bench test (time 5:35)
- O2 sensor test (time 10:26)
- Oxygen sensor testing (time 3:35)
- GM oxygen sensor (time 1:43)
- Oxygen sensor testing (time 5:55)
- Bias voltage testing (time 12:06)
- AFR sensor current pump signal circuit (time 1:52)
- AFR sensor signal circuit (time 3:02)
- AFR sensor ground circuit (time 1:26)
- AFR sensor out-put signal circuit (time 2:07)
- O2 sensor heater circuit (time 1:34)
- O2 sensor signal circuit (time 1:14)
- Oxygen and ECM circuits (time 1:27)
- Oxygen sensor (time 6:42)
- Oxygen sensors (time 3:23)
- Oxygen sensor troubleshooting part 1 (time 7:59)
- O2 sensor diagnostics (time 3:10)
- Oxygen sensors and wiring diagrams (time 2:52)
- Oxygen sensor (time 4:50)
- Sensor types (time 7:20)
- Wide band air fuel sensor (time 2:48)
- Wide band oxygen sensor circuit (time 1:45)