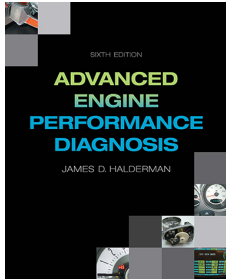


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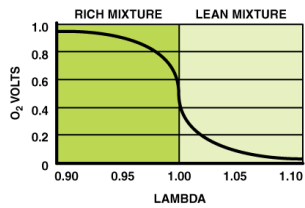


CHAPTER 20

Wide-Band Oxygen Sensors

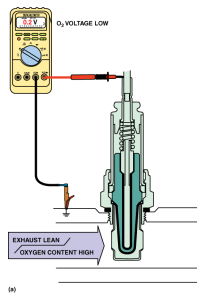
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Figure 20.1 A conventional zirconia oxygen sensor can only reset to exhaust mixtures that are richer or leaner than 14.7:1 (lambda 1.00).



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Figure 20.2A When the exhaust is lean, the output of a zirconia oxygen sensor is below 450 mV.



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Figure 20.2B When the exhaust is rich, the output of a zirconia oxygen sensor is above 450 mV.

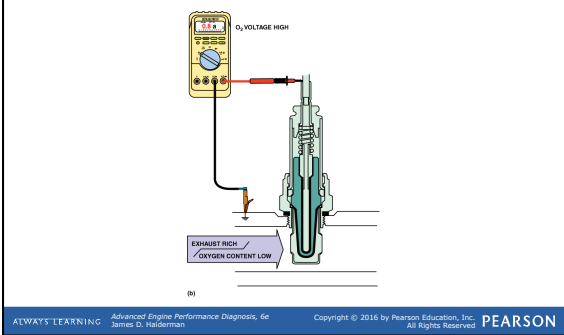


Figure 20.3 Most conventional zirconia oxygen sensors and some wide-band oxygen sensors use the cup-type design.

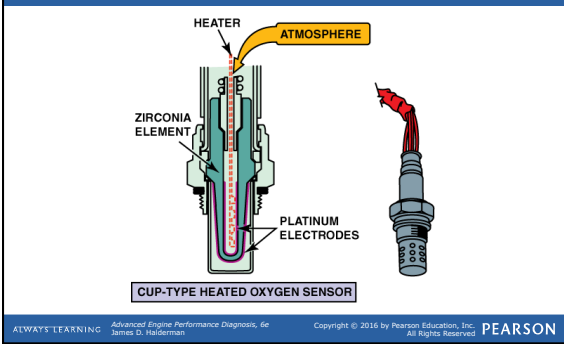


Figure 20.4 A typical heated zirconia oxygen sensor, showing the sensor signal circuit that uses the outer (exhaust) electrode as negative and the ambient air side electrode as the positive.

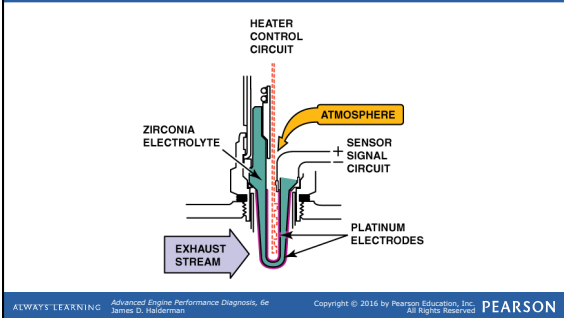


Figure 20.5 A planar design zirconia oxygen sensor places all of the elements together, which allows the sensor to reach operating temperature quickly.

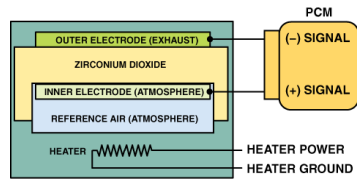


Figure 20.6 The reference electrodes are shared by the Nernst cell and the pump cell.

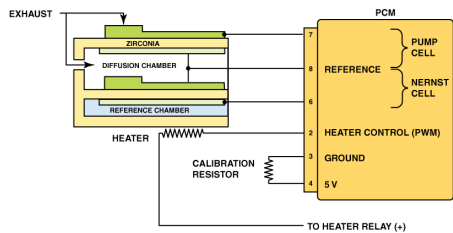


Figure 20.7 When the exhaust is rich, the PCM applies a negative current into the pump cell.

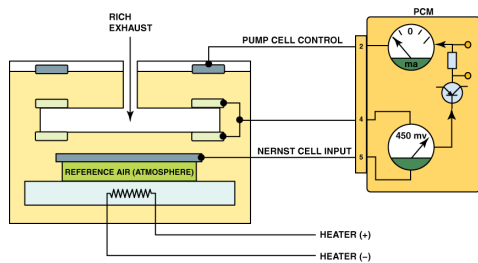
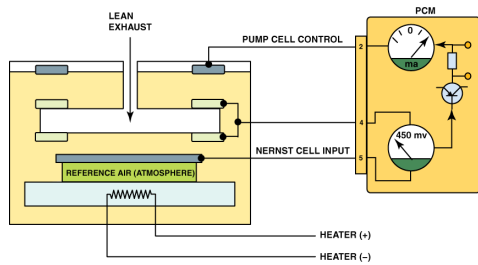
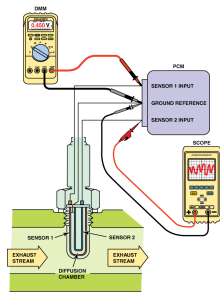


Figure 20.8 When the exhaust is lean, the PCM applies a positive current into the pump cell.



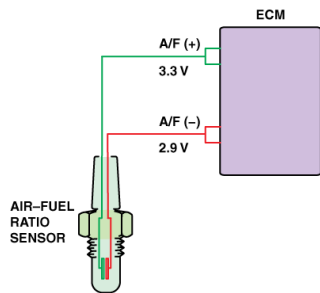
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Figure 20.9 Testing a dual-cell wide-band oxygen sensor can be done using a voltmeter or a scope.



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Figure 20.10 A single-cell wide-band oxygen sensor has four wires with two for the heater and two for the sensor itself.



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Figure 20.11 The scan tool can display various voltages but will often show 3.3 volts because the PCM is controlling the sensor by applying a low current to the sensor to achieve balance.

