

Name _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

1) How does the changing of the valve timing or opening affect the engine?

2) What is an indexed spark plug?

3) What is the difference between a conventional oxygen sensor and a wide-band oxygen sensor?

4) How does the Atkinson cycle differ from a conventional (Otto) four-stroke cycle?

5) What is the difference between port fuel injection and gasoline direct-fuel injection?

6) What features are different between an engine used in a hybrid vehicle and the engine used in a conventional vehicle?

Answer Key

Testname: HYBRID4_SHORT3

- 1) Changing the valve timing moves the torque curve either to high or low engine speeds to optimize engine performance and fuel economy.
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- 2) An indexed spark plug means that the spark plug is constructed so the open end of the electrodes face toward the intake valve when installed.
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- 3) A conventional oxygen sensor is able to detect an air-fuel mixture either richer or leaner than the 14.7:1. A wide-band oxygen sensor is able to detect air-fuel mixture as rich as 12:1 and as lean as 20:1 in many cases.
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- 4) In the Atkinson cycle, the intake valve closes later than a conventional four-stroke cycle and combined with a high-compression ratio results in a greater expansion ratio and higher efficiency.
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- 5) The injector is located about three inches from the intake valve in the intake manifold on a port fuel injection system and is located in the combustion chamber on a direct fuel engine system.
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- 6) Many inline four-cylinder engines used in hybrid electric vehicles use an offset crankshaft to reduce piston wall friction.
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