

Name \_\_\_\_\_

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

1) How is the fuel delivery system different from a port fuel injection system?

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2) What are two advantages of gasoline direct injection compared with port fuel-injection?

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3) What are the basic modes of operation of a GDI system?

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4) What are two disadvantages of gasoline direct injection compared with port fuel injection?

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## Answer Key

Testname: ENGINEPERF5\_SHORT28

1) A vehicle equipped with gasoline direct injection uses a fuel pump in the fuel tank similar to a conventional port injection system. Then, the fuel is sent to a high-pressure pump driven by the camshaft to the fuel rail. The computer controls fuel pressure using an electric pressure-control valve.

Page Ref: 438

2) Advantages include:

- Improved fuel economy due to reduced pumping losses and heat loss
- Allows a higher compression ratio for higher engine efficiency
- Allows the use of lower octane gasoline
- The volumetric efficiency is higher
- Less need for extra fuel for acceleration
- Improved cold starting and throttle response
- Allows the use of greater percentage of EGR to reduce exhaust emissions
- Up to 25% improvement in fuel economy
- 12% to 15% reduction in exhaust emissions

Page Ref: 436

3) The basic modes of operation include:

- Stratified mode
- Homogeneous mode

Page Ref: 438

4) Disadvantages include:

- Higher cost
- More components
- Need for NOX storage catalyst in some applications

Page Ref: 436