

*Automotive Engines 10th*

**Chapter 19 Intake and Exhaust Systems**

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

1. How can fuel-injected engine intake manifolds be tuned to improve engine performance?
2. What are the three main jobs of the air cleaner and filter?
3. How does a muffler quiet exhaust noise?
4. What is the purpose and function of exhaust system hangers?
5. What is a variable intake manifold?

## Answer Key

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1. Intake manifold runners are tuned to improve engine performance.

- Long runners build low-RPM torque.
- Shorter runners provide maximum high-RPM power.

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2. The three main jobs of the air cleaner and filter include:

- Clean the air before it is mixed with fuel
- Silence intake noise
- Act as a flame arrester in case of a backfire

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3. A muffler quiets the exhaust by smoothing out the high-pressure exhaust pulses and allowing them to be released at an even and constant rate.

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4. The muffler and tailpipe are supported with brackets, called hangers, which help to isolate the exhaust noise from the rest of the vehicle.

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5. Variable intake manifolds, commonly called a variable-length intake manifold (VLIM), allow the engine to produce a higher level of torque and horsepower over a wide range of engine speeds.

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