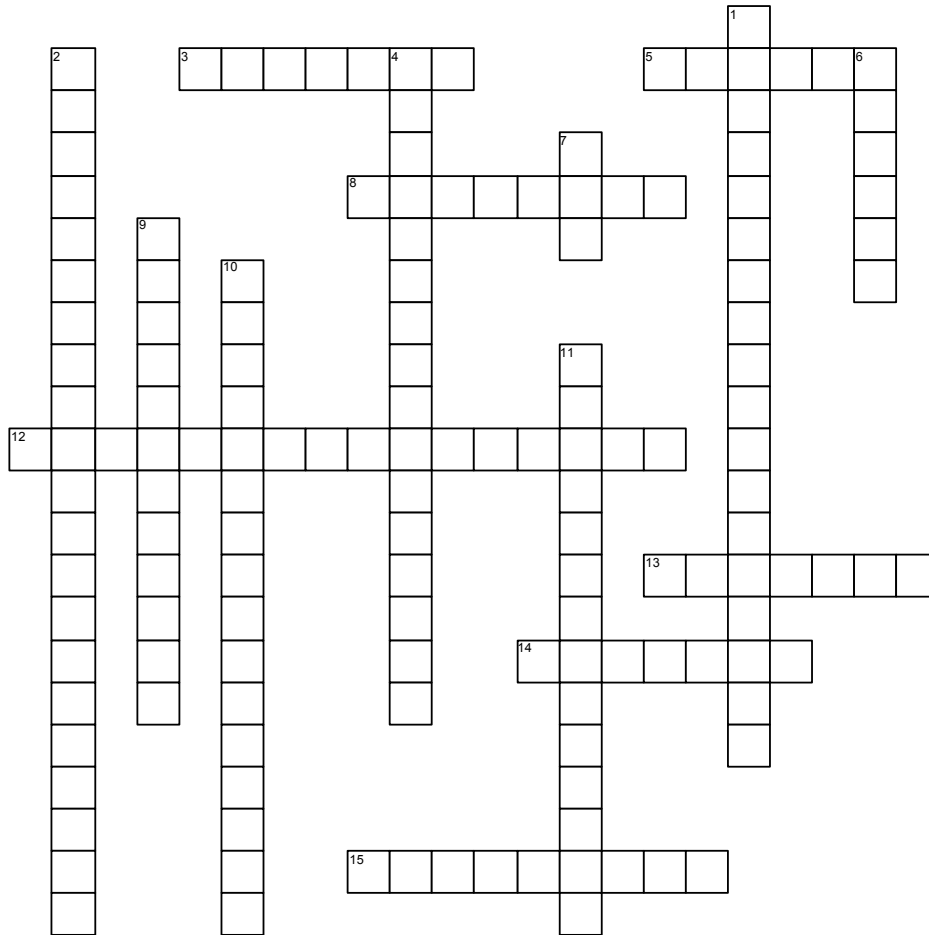


# Intake And Exhaust Systems

## Chapter 20



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### ACROSS

- 3 The \_\_\_\_\_ catches the large bursts of high-pressure exhaust gas from the cylinder, smoothing out the pressure pulses and allowing them to be released at an even and constant rate.
- 5 An upper manifold, usually called the \_\_\_\_\_, connects to the lower unit and includes the long passages needed to help provide the ram effect that helps the engine deliver maximum torque at low engine speeds.
- 8 The air filter is made of a chemically treated paper stock that contains tiny \_\_\_\_\_ in the fibers.
- 12 The size and shape of \_\_\_\_\_-\_\_\_\_\_ engine intake manifolds can be optimized because the only thing in the manifold is air.
- 13 The muffler and tailpipe are supported

with brackets, called \_\_\_\_\_, which help to isolate the exhaust noise from the rest of the vehicle.

- 14 \_\_\_\_\_ are used on new engines with tubing- or header-type exhaust manifolds.
- 15 Just as fuel filters are used to clean impurities from gasoline, an \_\_\_\_\_ is used to remove contaminants from the air.

### DOWN

- 1 A resonance tube is often called a \_\_\_\_\_, named for the discoverer of the relationship between shape and value of frequency.
- 2 Some air filter \_\_\_\_\_, especially on diesel engines, include an electrical switch used to light a dash-mounted warning

lamp when the air filter needs to be replaced.

- 4 Many \_\_\_\_\_ have heat shields to help keep exhaust heat off the spark plug wires and to help keep the heat from escaping to improve exhaust emissions.
- 6 One \_\_\_\_\_ is equal to 0.000039 in.
- 7 To reduce the emission of NO<sub>x</sub>, engines have been equipped with \_\_\_\_\_ valves.
- 9 A \_\_\_\_\_-\_\_\_\_\_ fuel injector forces finely divided droplets of liquid fuel into the incoming air to form a combustible air-fuel mixture.
- 10 The \_\_\_\_\_ is a tube that is often designed to be long so that the exhaust gas is cooled before it enters the EGR valve.
- 11 The \_\_\_\_\_ is also called an inlet manifold.