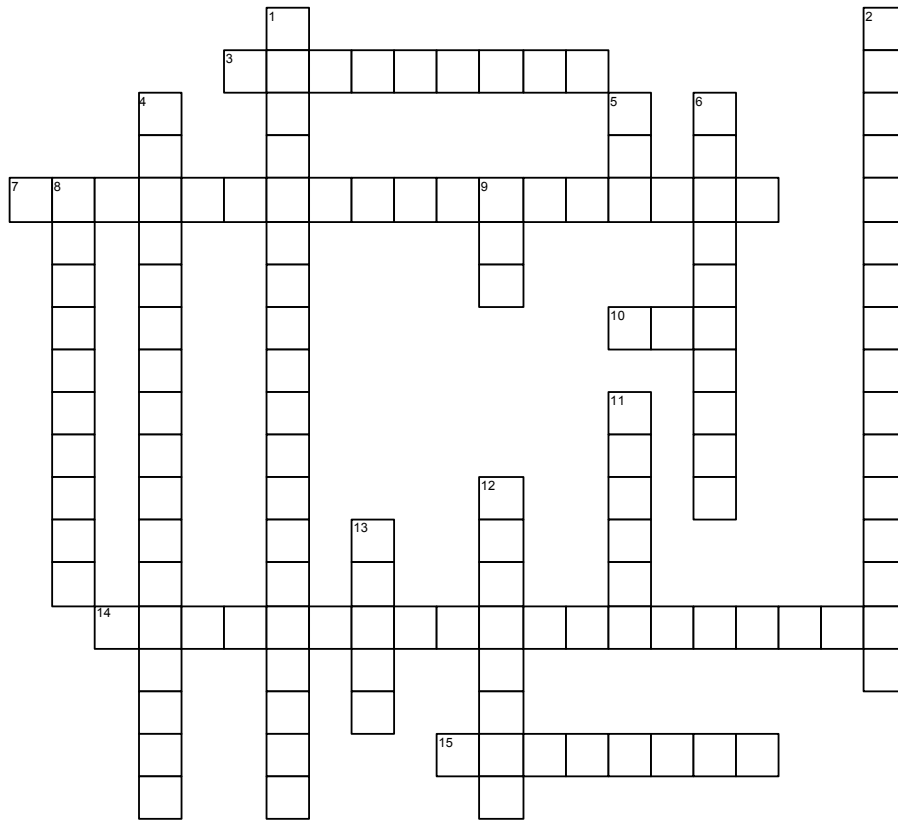


# Emission Control Devices Operation and Diagnosis

## Chapter 32



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### ACROSS

- 3 Most GM and many other vehicles use a \_\_\_\_\_ that contains a pulse-width modulated solenoid to precisely regulate exhaust gas flow and a feedback potentiometer that signals the computer regarding the actual position of the valve.
- 7 A \_\_\_\_\_ is an aftertreatment device used to reduce exhaust emissions outside of the engine.
- 10 \_\_\_\_\_ systems were developed to ventilate the crankcase and recirculate the vapors to the engine's induction system so they can be burned in the cylinders.
- 14 Measure the inlet and the outlet temperatures using an \_\_\_\_\_.
- 15 The catalytic converter uses a \_\_\_\_\_, which is a chemical that helps start a chemical reaction but does not enter into the chemical reaction.

### DOWN

- 1 The catalytic converter does not work when cold, and it must be heated to its \_\_\_\_\_ of close to 500°F (260°C) before it starts working at 50% effectiveness.
- 2 A \_\_\_\_\_ sensors monitors the rate with which vacuum increases in the system.
- 4 Many vehicles use a \_\_\_\_\_ as part of the evaporative control system diagnosis equipment.
- 5 \_\_\_\_\_ is an emission control system that lowers the amount of NOx formed during combustion.
- 6 A \_\_\_\_\_ contains a spring-type metallic disc or reed that closes under exhaust backpressure.
- 8 By a process called \_\_\_\_\_, the fuel vapor molecules adhere to the carbon surface.
- 9 Excessive \_\_\_\_\_ emissions are controlled by the exhaust gas recirculation system and the catalytic converter.
- 11 Since the early 1990s, many converters contain \_\_\_\_\_, an element that can store oxygen.
- 12 The substrate is coated with a porous aluminum material called a \_\_\_\_\_, which makes the surface rough.
- 13 The recirculated exhaust gas is \_\_\_\_\_ and does not enter into the combustion process.