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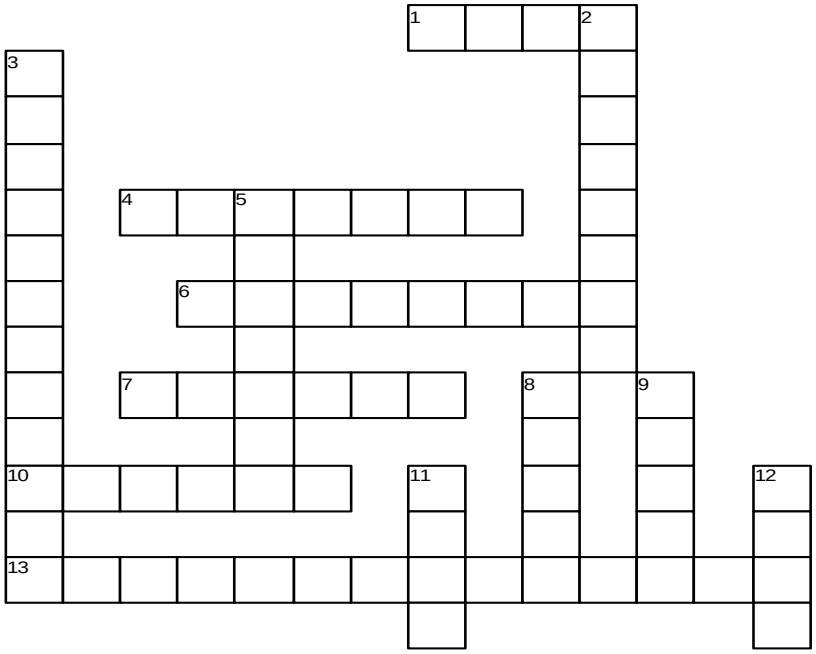
Advanced Engine Performance Diagnosis 8th Edition

Chapter 26

Vehicle Emissions Standards and Testing



ACROSS

1 _____ indicator: Oxygen (O2) levels in the exhaust that indicate a lean air-fuel mixture, often detected through exhaust gas analysis.

4 _____ Test Procedure: A standardized test procedure used to measure vehicle emissions and ensure compliance with emission standards.

6 Carbon _____: An unstable gas produced by incomplete combustion, which can combine with oxygen to form CO2. High levels of CO indicate a rich air-fuel mixture.

7 _____ of Nitrogen: Gases formed at high temperatures and pressures in the combustion chamber. NOX contributes to air pollution and smog formation.

10 An essential element in combustion. The amount of O2 in the exhaust indicates whether the air-fuel mixture is rich or lean.

13 _____ ratio: The ideal air-fuel ratio (14.7:1 for gasoline) where all the fuel is burned with the available oxygen, ensuring efficient combustion.

DOWN

2 A colorless, odorless gas that makes up most of the Earth's atmosphere and is present in the engine's intake air.

3 Unburned fuel particles that escape into the exhaust. High levels of hydrocarbons usually indicate an ignition system problem or engine misfire.

5 Carbon _____: A gas produced during the combustion process when oxygen combines with carbon from the fuel. It is an indicator of an efficiently operating engine.

8 A molecule made of three oxygen atoms. Ground-level ozone is a harmful component of smog, while ozone in the upper atmosphere protects the Earth from UV rays.

9 A byproduct of combustion when hydrogen from the fuel combines with oxygen, forming water vapor in the exhaust.

11 A type of air pollution caused by the interaction of sunlight with pollutants like hydrocarbons and nitrogen oxides, leading to the formation of ozone.

12 _____ indicator: Carbon monoxide (CO) levels in the exhaust that indicate a rich air-fuel mixture.