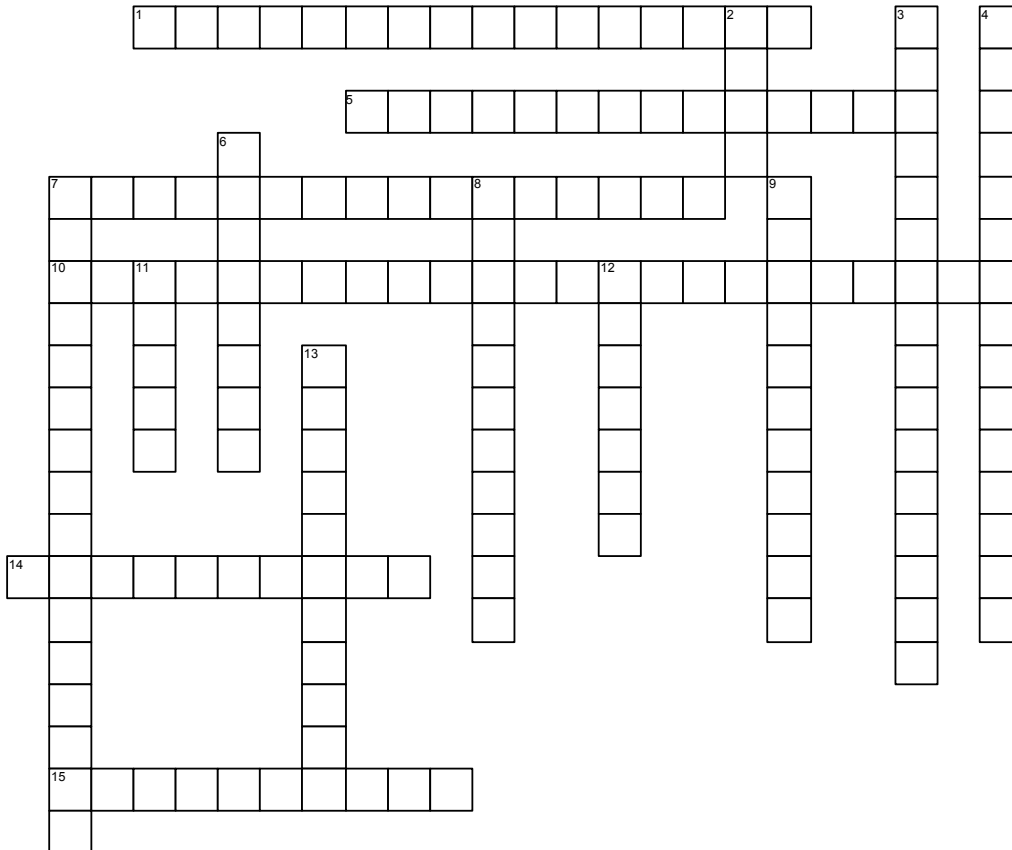


Gasoline Direct-Injection Systems

Chapter 21



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ACROSS

- 1 One advantage of direct injection vs. port-injection is improved cold starting and _____.
- 5 In the _____ of operation, the injection occurs just before the spark occurs resulting in lean combustion, reducing fuel consumption.
- 7 One advantage of direct injection vs. port-injection is a 12% to 15% reduction in _____.
- 10 Several vehicle manufacturers are using _____, which sprays high-pressure fuel into the combustion chamber as the piston approaches the top of the compression stroke.
- 14 One disadvantage of direct injection vs. port-injection is the _____ due to high-pressure pump and injectors.
- 15 One disadvantage of direct injection vs. port-injection are there are more _____.

DOWN

- 2 GM refers to GDI systems as _____ systems.
- 3 The _____ sensor connects to the PCM with three wires.
- 4 In _____, the injector is pulsed one time to create an even air-fuel mixture in the cylinder.
- 6 The _____ stores the fuel from the high-pressure pump and stores high pressure fuel for use to each injector.
- 7 One advantage of direct injection vs. port-injection is the higher _____.
- 8 In the _____-_____ combustion design, the injector is placed in the center of the combustion chamber and injects fuel into the dished out portion of the piston.
- 9 One advantage of direct injection vs. port-injection is up to 25% improvement in _____.
- 11 With the combination of high-pressure _____ injectors and modified combustion chamber, almost instantaneous vaporization of the fuel occurs.
- 12 Depending on when the fuel is injected into the combustion chamber, helps determine how the air-fuel is moved or tumbled.
- 13 One advantage of direct injection vs. port-injection is that it allows the use of _____-_____ gasoline.