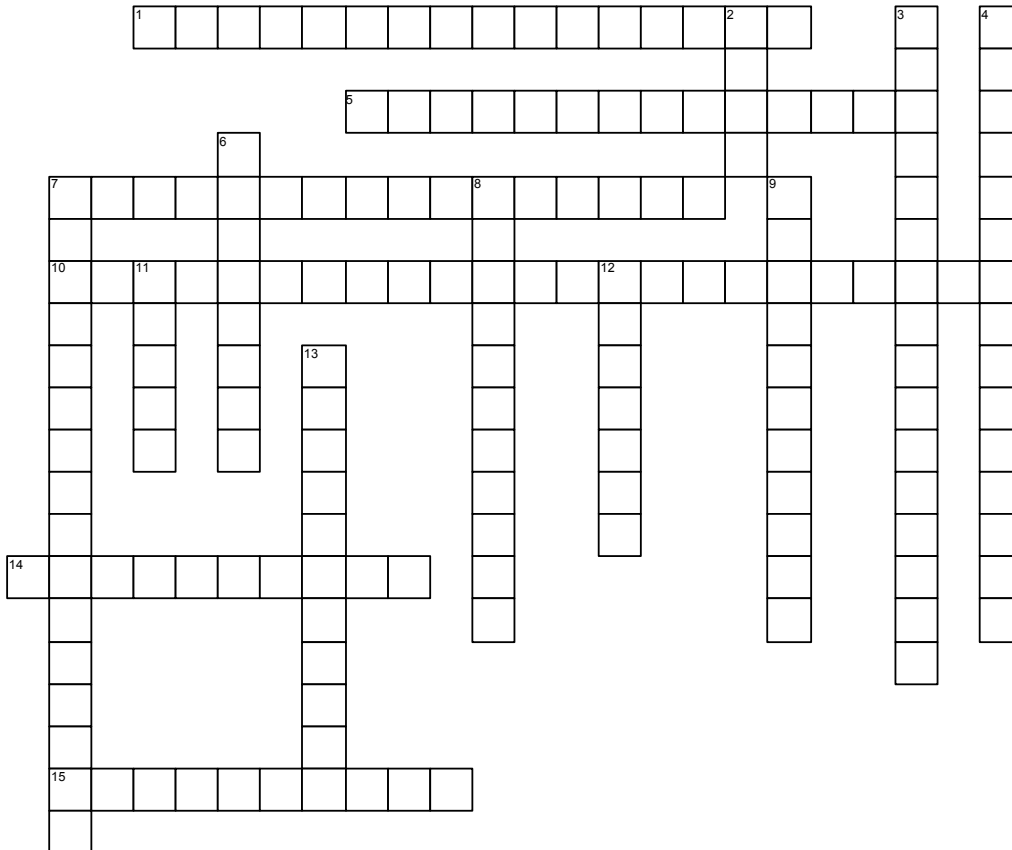


# Gasoline Direct-Injection Systems

## Chapter 24



<http://jameshaldeman.com>

### 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.