Gasoline Direct-Injection Systems
Chapter 79

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. On disadvantage of direct injection vs. port-injection is the ________ ______ due to high-pressure pump and injectors.
15. On 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 combination 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.