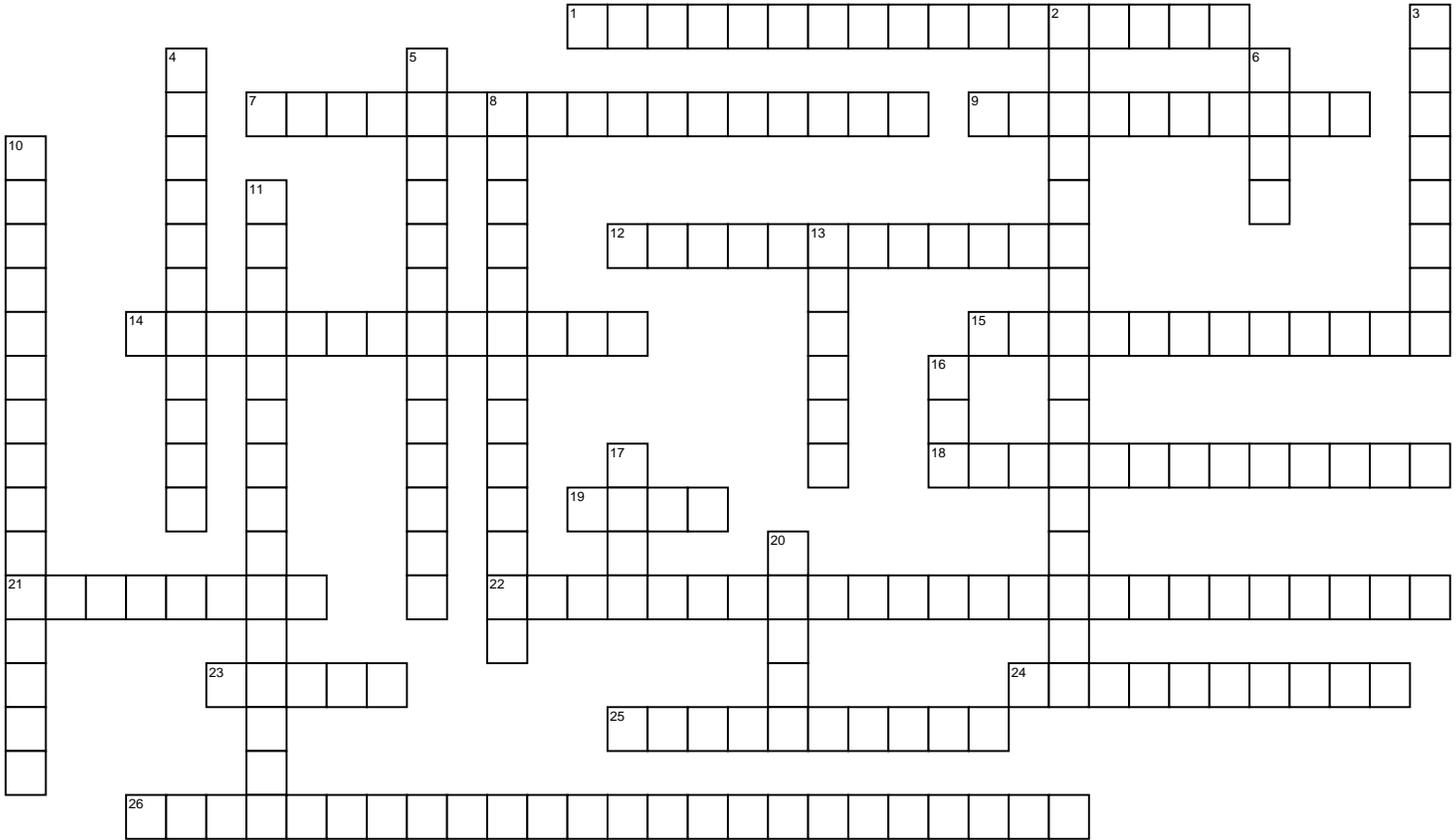


# Chapter 1

## Diesel Engine Operation



### ACROSS

- 1 Used in older diesel engines, fuel is injected into a small pre-chamber, which is connected to the cylinder by a narrow opening. This design is called an indirect injection (IDI) diesel engine.
- 7 A power chamber where the chemical energy of the diesel fuel is converted into heat.
- 9 design A term used to describe an overhead valve or pushrod design valve train.
- 12 The valve that opens to allow exhaust gases to escape the combustion chamber.
- 14 An engine where the camshaft is in the block and the valves are located in the cylinder head.
- 15 \_\_\_\_\_ is the cubic inch (cu. in.) or cubic centimeter (cc) volume displaced, or how much air is moved by all of the pistons.
- 18 A cast or forged rod that connects the piston pin to the crankshaft and transfers engine torque to the crankshaft.
- 19 When only one overhead camshaft is used, the design is called a single overhead

- camshaft (SOHC) design.
- 21 A hole in an engine block where a piston is installed.
- 22 An engine that burns fuel outside of the engine itself, such as a steam engine.
- 23 A term used to express the repeating movement of the piston through 4-strokes equals one cycle.
- 24 A process where chemical energy in fuel is converted to heat energy by the burning of the fuel at a controlled rate.
- 25 A cast or forged shaft that converts the reciprocal motion of the pistons to rotary motion.
- 26 An engine where engine combustion occurs above the piston.

### DOWN

- 2 The ratio of the difference in the cylinder volume when the piston is at the bottom of the stroke to the volume in the cylinder above the piston when the piston is at the top of the stroke.
- 3 A steel or cast iron shaft that has lobes designed to open and close intake and exhaust valves.

- 4 A valve used to allow air into the combustion chamber in a diesel engine.
- 5 Engines with the camshaft in the block using pushrods to transfer the motion of the camshaft lobes to the valves, using pushrods and rocker arms.
- 6 When two overhead camshafts are used, the design is called a double overhead camshaft (DOHC) design with one cam operating the intake valve and the other operating the exhaust valves.
- 8 The position of the piston at the very top of either the compression or exhaust stroke.
- 10 In a diesel engine where fuel is injected directly into the cylinder.
- 11 The four strokes of the four-stroke cycle are intake, compression, power, and exhaust.
- 13 The stroke of an engine is the distance the piston travels from top dead center (TDC) to bottom dead center (BDC).
- 16 The piston position when it is at the bottom of the stroke.
- 17 The diameter of a cylinder is

- called the bore and is measured in inches or millimeters (mm). The larger the bore, the greater the piston head area on which the gases have to work.
- 20 All automotive and truck engines are constructed using a solid frame, called an engine block. A block is constructed of cast iron or aluminum and provides the foundation for most of the engine components and systems. The block is cast and then machined to very close tolerances to allow other parts to be installed.