

Technology Forecast

Fuel Injection: More Bang for the Buck

Better fuel economy? More power? Both? The use of direct fuel injection technology will make improvements in each area possible. Some engineers think drivers will see gains of at least 25 percent in mpg and engine torque.

Direct fuel injection differs in important ways from today's fuel injection systems. Today's systems simply spray fuel into the intake manifold. When the intake valve opens, air is drawn into the cylinder. The air then carries the fuel along with it at normal pressure.

Some efficiency and energy are lost with today's fuel injection systems because some of the vaporized fuel condenses. As the fuel turns back into a liquid, it drops out of the flow. It then passes unburned through the exhaust system.

With direct fuel injection, the fuel is sent—under high pressure—directly to each cylinder. The fuel arrives as the piston comes up on the compression stroke. Air then fully surrounds the vaporized fuel so combustion can occur. More power and fuel economy result because all of the fuel is ignited by the spark plug.

Direct fuel injection is already in use by some automakers. Because it is expensive, it is usually used on higher-priced models.

Action Activity

Find out which vehicles use direct fuel injection. Compare their mpg, engine specs, and cost with other vehicles. How much does this feature add to the price of a vehicle? Report your findings to the class.