

## Technology Forecast

### *Environmentally Friendly Assembly*

Tougher environmental laws are forcing automakers to develop creative solutions to keep our air clean. Automotive engineers are considering new ways to assemble engines that will cut down on pollution.

One idea is to move the catalytic converter from the exhaust pipe to the exhaust manifold. Moving the device would allow it to reach operating temperatures faster and reduce harmful emissions sooner. This gain is important since most engine emissions are released into the air after a cold start-up.

Integrating the catalytic converter with the exhaust manifold would also allow each engine cylinder to have its own oxygen sensor. The vehicle computer could then make immediate and individual adjustments to the air/fuel mix for greater efficiency. Performance would increase and emissions would decrease.

The only downside to this solution is cost. Additional sensors would add expense to the assembly process, but the benefits of cleaner air may outweigh the cost concern.

Automakers are also looking for ways to minimize engine noise, vibration, and harshness (NVH). A solution that is likely to gain wider application in the industry is the use of direct-mounted accessories. With auxiliary devices attached directly to the engine, rattle-prone brackets and mounting assemblies are no longer needed. Direct mounting would also help components such as the generator and power steering operate more efficiently.

#### **Action Activity**

Find out about new engine designs that feature one or more direct-mounted components. Select one engine design. Prepare a 15-second infomercial that describes the direct-mounted feature(s). State the advantages and disadvantages of the design. Present the infomercial to the class.