

Get Smart

Closed-loop EFI brings high-tech brainpower and unmatched fuel efficiency to the mower engine.

Are your lawn mowers running *stoichiometrically*?

It's not a trick question. However, the answer might depend on whether or not your mowers are powered by closed-loop electronic-fuel-injection (EFI) engines. Stoichiometric combustion—a fancy way of saying “optimal fuel usage”—is one of the prime advantages of closed-loop EFI engines over open-loop EFI and carbureted engines. And while “stoichiometric” might sound like some kind of abstract Zen concept, achieving it produces tangible fuel savings and emissions reductions for landscape professionals.

AUTOMOTIVE TECHNOLOGY

With its origins in the automotive industry, closed-loop EFI engines incorporate an oxygen sensor in the muffler, which analyzes exhaust gases and sends data to an electronic control unit (ECU). If the data indicate the air-fuel mixture isn't ideal, the ECU adjusts the ratio of ingredients to maximize power while optimizing fuel usage. These systems close the loop, so to speak, between the air-fuel intake and the exhaust output, supplying a constant stream of critical operating information to the ECU.

“The ECU in a closed-loop EFI engine is collecting all of this information from the engine, plugging it into a series of mathematical equations and saying, ‘Perfect, this is what I need to input to provide optimal performance, power and efficiency,’” explains Brandon Fredricks, marketing channel manager for Kohler Engines.

What does this mean for the landscape professional? “Kohler's closed-loop Command PRO EFI engines use 25 percent less gasoline compared with similar-size carbureted engines. In real dollars, this translates to \$600 of fuel savings per engine in a year*.”

ADAPTING TO ALL OPERATING CONDITIONS

Kohler's closed-loop EFI system includes a manifold atmospheric-pressure (MAP) sensor that helps the engine adjust to fluctuations in weather conditions and altitude. The MAP sensor, along with other sensors in the system, are continuously providing feedback in pursuit of stoichiometric combustion—there's that word again—regardless of the operating conditions.



**Kohler's
Command
PRO EFI Engine**

“Our closed-loop EFI is unique because—unlike a carbureted or open-loop system—it's constantly adapting to the operating environment as well as changes within the engine,” Fredricks says. “So, in addition to making adjustments for humidity, temperature, altitude, and air quality—it's also adjusting based on the engine's oil temperature, cylinder temperature, air flow and more.”

A closed-loop EFI system is automatically recalibrating itself multiple times per second. This continuous loop of analysis, feedback, and adjustment also enables closed-loop engines to start up immediately—which is music to the ears of any operator who has gone through the rigmarole of choking and priming a carbureted engine on a cold morning.

“On our Command PRO EFI engines, the minute you turn the key the closed-loop system is already taking readings from all of the sensors to figure out the ideal air-fuel mixture,” says Fredricks.

LESS DOWNTIME

Kohler's closed-loop EFI system not only puts automotive-grade technology in the hands of operators, but also at the fingertips of the people who maintain the lawn mowers.

With Kohler's proprietary diagnostic software, maintenance personnel can simply connect to their laptop to perform a detailed troubleshooting analysis. The software not only identifies problems, but it also provides step-by-step instructions for quickly resolving the identified problem.

“We've really taken the guesswork out of engine service and repair,” Fredricks says. “Just like the automotive industry, our diagnostic software allows for quicker and better repairs, maximizing productivity and minimizing downtime.”

Many commercial OEMs have already integrated Kohler Command PRO EFI engines into their products. And the technology has been adopted by landscape pros nationwide who have responded favorably to the enhanced performance and fuel savings delivered by the line. For additional details, visit KohlerEngines.com.

**Compared to a comparable Kohler carbureted engine under comparable loads and duty cycles. Based on 600 hours of annual operation.*