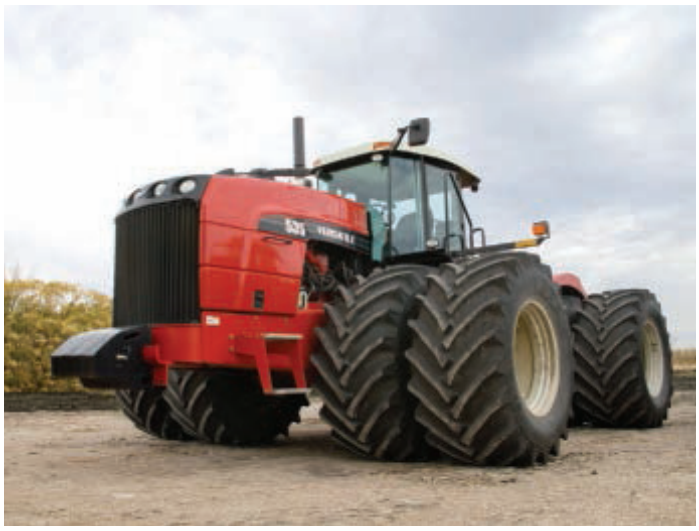

Cummins has tested its Tier 4 interim engine systems in a wide variety of applications, including a wheel loader and an ag tractor.

own XPI fuel injection and control technology that offers injection pressures as high as 30,000 psi that is incorporated on some of its Tier 4 engines. Others will use Cummins control systems teamed with Bosch fuel injection components.

- Variable geometry turbochargers from Cummins Turbo Technologies.
- Cooled exhaust gas recirculation (EGR), which the company has been using in its on-highway engines since 2002.
- A combined diesel oxidation catalyst (DOC)/diesel particulate filter (DPF) module that the company has used in truck and bus markets for more than three years.

"A significant amount of planning and analysis preceded the actual start of the field test program to ensure we would generate the most effective results," said Tadros. "Our initial planning started in June 2007, some three and one-half years ahead of the emissions standard effect date in January 2011.

"As a team, we wanted to learn from previous experiences on both automotive and industrial Tier 3 engines. We also wanted to capture a broad range of applications, duty cycles and different work environments with a selected group of field test applications. We also worked to obtain solid data that demonstrate reliability and durability of the Tier 4 interim new engines, the Cummins Particulate Filter and Direct Flow air filter."

Cummins said its testing has confirmed up to 5% higher fuel efficiency than in comparable Tier 3 machines, as well as improved productivity. The Tier 4 interim repowered equipment on the field tests typically achieved 98 to 99% uptime, equivalent to Tier 3 levels of in-service reliability, the company said.

Field test participants reported that the Tier 4 interim system was effectively transparent to how they operated their machines, with the self-regenerating Cummins Particulate Filter requiring no user intervention.