

Getting to know SCR

By James Menzies

GREENSBORO, N.C. – During a recent visit to Volvo Group's North American headquarters, a group of trade press journalists was challenged to identify which of two seemingly identical trucks was equipped with selective catalytic reduction (SCR). Short of guessing, there was no way to get it right.

It certainly wasn't possible to visibly discern the difference between the two vehicles, one of which was rigged with an EPA07 emissions system and the other with SCR, which Volvo and most other OEMs will use to comply with the more stringent 2010 emissions standards.

The same could be said for the way the truck operated on the highway – the truck with SCR looked, felt and sounded the same as any other Volvo VN.

Outside having to keep an eye on diesel exhaust fluid (DEF) levels, the transition to SCR-equipped vehicles in 2010 should be seamless for the driver.

Volvo's Jim Fancher removed the side fairings from the SCR-equipped VN on display to reveal what exactly will comprise the system that will be used in 2010.

"The system will consist of three major components," Fancher explained.

On the driver side is a heated DEF tank, which is easily-identified by a blue cap. Volvo will offer two tank sizes: 10 gallons for day cabs and straight trucks; and 13 gallons for long-haul. In long-haul applica-

tions, a truck should be able to run 4,000 miles between DEF tank refills, Fancher said. DEF will be consumed at about a 2-4% DEF-to-diesel ratio. (Two to four gallons of urea will be required for every 100 gallons of diesel the vehicle consumes).

The DEF tank features a narrow filler neck, to prevent a driver from mistakenly filling it with diesel.

The other two SCR components are an injector and an SCR catalyst, which are both located on the passenger side of the vehicle. The diesel particulate filter (DPF) will not change in 2010, except at the outlet where the DEF injector is located.

The injector doses DEF into the exhaust stream as it leaves the particulate filter.

It then travels into the SCR catalyst where a chemical reaction occurs, converting NOx into harmless nitrogen and water vapour.

The engine itself will look the same, but since NOx will be eliminated downstream in the SCR catalyst, Fancher noted Volvo will use less exhaust gas recirculation (EGR) and reprogram the engine for improved performance and fuel economy.

"We will continue to optimize our software and the engine operations even long after we release (SCR engines) with January, 2010 production," Fancher said. Reducing EGR levels is good for fuel economy, and also has the added benefit of allowing the engine to produce more NOx in-cylinder, which allows for a

more efficient DPF regeneration cycle, the company claims.

"NOx is one of the major elements used in the regeneration to clean out the carbon," Fancher explained. "So by putting more NOx out of the engine, we enhance the passive regeneration of the DPF."

One drawback of SCR is that the system occupies a considerable amount of frame rail space.

"We're trying to maintain as much workability with the vehicle as possible even though we are taking up some of that critical frame rail real estate," Fancher said.

The system will also add weight, but just how much weight is still up in the air as Volvo continues to tinker with the layout of the system.

But from a driver perspective, there appears to be little to worry about.



TAKING A PEAK: The SCR catalyst is located on the passenger side of the truck, but hidden from sight by the side fairings.

Unless you're accustomed to running more than 4,000 miles at a time, you may never even have to seek out DEF, which should be widely available at truck stops and dealers by 2010. □

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