Tampering Not New, But Dirties Exhaust and Can Damage Engines, Reps Say

How much tampering with exhaust emissions equipment goes on out there? No one knows for sure, but panelists at a session of the Technology & Maintenance Council’s fall meeting in Pittsburgh last week said they had seen some flagrant cases.

Tampering attempts have become more desperate and damaging since 2002, when exhaust-gas recirculation equipment first appeared on diesels, and 2007, when particulate filters were required.

Tampering is anything that takes a vehicle out of its original government-certified state. It's been going on with truck diesels since there were government emissions standards. Simple sneakiness has included leaving the elements out of air filter canisters and turning up mechanical fuel pumps.
But the attempts have become more desperate and damaging since diesels became highly complex starting in 2002, when exhaust-gas recirculation equipment first appeared on diesels, and 2007, when particulate filters were required, said people on the panel. Some examples:

**Blocking or restricting EGR plumbing; removing catalysts from chambers in the exhaust system; and doing electronic modifications to make a sensor think diesel exhaust fluid is present when it’s not.**

Often such mods will damage pistons, rings, cylinder walls, injectors, and other internal parts because they introduce too much fuel and heat. But “today’s sensors can pick up most of these,” said Bill Puchniarz, manager, engine support and improvement, at Navistar International.

**Drilling holes in substrates of diesel particulate filters to make exhaust gases flow more freely through the honeycomb structures.**

This defeats the purpose of the DPF, which is to remove soot from the exhaust, and affects reliability of the devices, noted Kevin Otto, service director for Cummins Emissions Solutions. And it probably voids the warranty on an engine and its aftertreatment systems, because warranties expressly forbid “unauthorized modifications.”

Moreover, “there are frequently short- and long-term unintended consequences,” he said. Changing one or more components can upset a careful balance between performance and emissions reduction. He has seen DPF substrates that were cracked and even melting because of changes upstream. The melting point of the ceramic material is 1,400 degrees C (about 2,500 F), compared to 600 degrees C (about 1,100 F) when exhaust leaves the engine.

**Disconnecting the exhaust pipe from the DPF to completely avoid it.**

In one case found by the federal Environmental Protection Agency, someone had cut into the pipe ahead of the DPF, and gases were exiting the system under the cab, said Anne Wick, diesel engine consent decree coordinator for the agency. The driver breathed in carbon monoxide and fell ill, and had to go to a hospital; doctors found CO in his blood.

Wick listed ailments attributed to diesel exhaust, especially its particulate matter, ranging from irritated eyes to asthma and other internal damage to lungs and
passages in the nose and throat. These are the reasons engines face limits on exhaust emissions, she said.

**Facing the Consequences**

How prevalent is tampering? No one can know for sure, but the Environmental Protection Agency does a lot of equipment evaluations to find evidence of tampering “to keep a level playing field for the industry,” said Bob Klepp, chief of air quality enforcement. “We have found that some fleets have 50% of their vehicles tampered with, and we follow up with enforcement.”

Penalties under federal law are $37,500 per violation for a dealer or manufacturer and $3,750 for an individual. A court can order that the offending engine be set back to where it is. EPA does a lot of calculating to arrive at a penalty that’s reasonable, Klepp said.

Examples include the landmark 1998 case where most American heavy truck and engine builders signed a consent decree with EPA admitting that they set electronic controls to pass emissions tests, then programmed them to reset to less stringent “defeat” settings during highway running. The penalty totaled $83 million among the builders, and they had to begin installing EGR gear in October 2002, 15 months before the original deadline for the equipment.

Lesser-known and more recent examples include:

- A $500,000 payment by Edge Products for selling devices that lessened the performance of DPFs on diesel pickups.
- Suzuki Motors paid a $885,000 fine for using a dual mapping system on its cars for highway and city.
- Casper’s Electronics, a small aftermarket firm, sold “oxygen sensor simulators” that degraded exhaust quality, and EPA fined it a modest $80,000 “because there was a demonstrated inability to pay more,” Klepp said.

This doesn’t mean that aftermarket devices are necessarily illegal, he said. Use of a non-original-equipment engine part is not tampering if it can be demonstrated that it doesn’t adversely affect emissions. A non-original engine change is also allowed if there are no adverse effects to emissions. These so-called safe harbors go back to 1974 and EPA’s Memo 1A, which set the policy.
Enforcement by various states, most notably California and certain others in the Northeast which use California standards, is done during roadside inspections or periodic equipment checks, said the EPA's Wick. Four states allow self-verification by fleet owners.