Fuel for thought

When a so-called fuel catalyst was put through its paces on a DAF truck at Millbrook, the fuel savings were almost as surprising as they were significant. Brian Tinham reports

Slick salespeople have attempted to blind transport managers with science for years – and none more so than those armed with fuel saving devices. But the consensus among hard-nosed engineers has it that, by and large, they don't work.

Nevertheless, some do seem to, as witnessed by the report from Carmarthenshire County Council (Transport Engineer, February, page 40). Now here's another one – this time, a so-called fuel catalyst, with its origins in the US. And so certain was Fuel Harmonics (the UK distributor) of its efficacy that, late last year, it put its Fitch fuel catalyst (FFC) to the test at the Millbrook proving ground.

What emerges is interesting. While some of the marketing blurb is enough to turn off most self respecting engineers, Millbrook's findings show an average 3% fuel efficiency improvement, as well as emissions reductions – albeit only after several thousand 'conditioning' miles.

Fuel restoration

First, some background. Fitch fuel catalysts have been manufactured by US-based Advanced Power Systems since at least 2001, when a report on the technology revealed improvement in octane rating when used to condition aged Texaco-87 fuel. Its effects on bacterial growths, thought to be responsible for premature fuel ageing, were also studied in 2002 by the Departments of Chemistry and Biology at the University of Connecticut in the US.

Subsequently, Saybolt, a subsidiary of Core Laboratories, demonstrated that the catalyst also improves cetane values in moderately aged diesel fuel. Its report says: "The difference between [the treated and untreated fuels] is that the alkane region ... increases, with respect to the aromatic and olefinic region."

Since then, the FFC has enjoyed occasional glowing reports, including one from City of York Council, claiming success. Now, though, we're looking at independent verification, with an unambiguous report from Millbrook, seen exclusively by Transport Engineer.

Fuel Harmonics enticed John Lewis to provide a 2004 DAF 85, with 1,014,886km on the clock, to Millbrook, which ran the tests in its variable temperature emission chamber. Its report states that the vehicle was tested three times over the FIGE cycle at 23°C, monitoring legislated bag emissions, as well as real-time hydrocarbons, carbon monoxide, NO and CO_2 at the tailpipe.

The Millbrook team then fitted the FFC, following the manufacturer's instructions (including touching the leads on the battery terminals together) and drove the truck for 1,000 miles on its test track before running three more FIGE tests. At this stage, Millbrook noted no significant fuel improvement and no changes with the emissions, except for carbon monoxide and particle mass, which were down 6.8% and 11.6% respectively.

But the story doesn't end there. The vehicle then returned to service for 4,000 miles before being delivered back for further tests. Although outside Millbrook's control, Colin Johnson, John Lewis' fleet engineering manager, certifies that no maintenance work was carried out during that time. Yet now Millbrook detected significant changes.

Using the same driver and the same batch of fuel, it found that, although emissions of hydrocarbons, CO and NO_X remained unchanged, both CO_2 emissions and fuel consumption had reduced by 3% (5.3% urban, 4% suburban, 1.8% motorway). Against that, particulate mass had risen 6.5%.

Says Roger Macnair of Fuel Harmonics: "By the time [fuel reaches a truck], it is likely to have degraded in a number of ways: increased water content; contamination, due to microbial growth; sludge formation; and/or breakdown of hydrocarbons. Fitting an engine with an FFC reverses these effects, allowing fuel to regain its 'refinery fresh' condition." TE