EMISSION CONTROL

Energenics assess the three types of fluids that workshop should look to have at their side when servicing SCR and DPF systems.

Emissions from diesel engines, notably particulates and NOx, are extremely damaging to human health, especially at the concentrations experienced in large cities. The recognition of this problem has led to a series of ever demanding emissions standards – the Euro levels – which have reduced the permissible levels of harmful emissions to a fraction of the Euro 1 (1992) limits: 5% for NOx, 2.8% for particulate matter. The increasing demands of legislation have led to a corresponding acceleration of changes in vehicle hardware.

Such is the scale of these changes, that it is not possible to design a diesel engine which can meet the latest Euro levels on its own. Instead, it is a combination of two components, the engine and the exhaust systems, which are certified together. The exhaust itself will contain either one of, or a combination of, two main technologies:

Selective Catalytic Reduction (SCR) – a combination of two catalysts and urea solution (AdBlue) injection, used to reduce NOx emissions.

Diesel Particulate Filters (DPF) – a ceramic porous soot filter sometimes combined with an oxidation pre-catalyst, DPFs are used to remove soot particles.

Workshops servicing and repairing these increasingly complex systems should bear in mind the importance of the three types of fluids running alongside and within them – the Fuels, Lubricants and Additives.

Fuels

In the UK, fuel should not be too great a worry, as Ultra Low Sulphur Diesel has been the standard for all diesel fuel for some years now (that is, diesel with a sulphur content of 10 parts per million or less). However, vehicles which spend time further afield than Europe; in countries where sulphur content of fuel may be higher, may be cause for concern. This is because sulphur in the exhaust gases can damage the catalysts in SCR and DPF systems, making them less efficient. DPFs may be more likely to block up with soot as a consequence.

Lubricants

Choice of lubricant is also an important consideration. Oils should be 'low SAPS' (low in Sulphated Ash, Phosphorous and Sulphur) for much the same reasons as fuel should be low-sulphur; to prevent damage to the catalyst systems involved. Because small amounts of oil are burned over time, it contributes to the ash which accumulates in the DPF. This ash cannot be removed in the usual regeneration process (like soot) and so will block up the filter over time. Low SAPS oils are designed to produce as little ash as possible, minimising this risk.

Additives

Finally, there are additives – both for the exhaust system and the fuel. Adblue is widely known and available as a consumable for SCR systems; a urea solution which reacts with NOx to form harmless gases. It is important for Adblue to be kept in good condition, as any impurities can damage the catalysts in the SCR. And, of course, it is essential to add it to the dedicated 'Adblue' tank, not to the diesel (and vice versa!)

But additives are also valuable aids to DPF systems. DPFs rely upon frequent regeneration (soot burning) to prevent blockage. To achieve reliable regeneration, engines have been programmed to inject extra fuel into the exhaust system but this comes at a cost to fuel economy, whilst putting thermal stress on the soot filter. Fuel Borne Catalyst (FBC) additives like Envirox DPF Assist have been developed to minimise the cost penalty and combat more serious blockages by rapidly initiating regeneration. Envirox DPF Assist works by:

- Decreasing the level of soot particles produced during combustion.
- Significantly lowering the temperature the exhaust gases need to reach to burn off the trapped soot particles in the DPF.

Even when soot build up is not bad enough to initiate warnings from the engine management system, a partially blocked filter is still bad news for the driver's fuel economy. The more soot there is in the filter, the harder the engine has to work to push the exhaust gases through it. This means burning more fuel per mile. The concentrated formula of Envirox DPF Assist means that it can be used on a regular one shot per tank basis to keep soot levels down to a minimum and guard against reblocking.

For more information on Energenics' Envirox DPF Assist circle 092 on the readerlink card