

Smokers have to pay more

Retrofit: The planned scaled toll system rewards the fitting of a particulate filter. For older HDVs and for HDVs with a lower Euro classification, this means lower charges. Suppliers have various systems on offer.

The government wants to reward investment in diesel particulate filters (DPF) by means of toll concessions. A bill proposes moving HDVs with a DPF up into particulate reduction class (PMK) 2, which will put them in toll category B together with Euro 4 HDVs. Their owners will then pay 4.2 cents less per kilometre than for Euro 3 HDVs with no DPF. The bill still needs to be passed by the Federal Council, however. According to reports, this could take place on October 10, 2008.

The suppliers of filter systems are ready for this day, or are at least on the verge of receiving a Vehicle Type Approval (ABE) for their filters. This is necessary in order to enjoy the benefits of the reduced charge and the green sticker.

Twintec, for example, offers filters at 5,000 Euro plus installation costs. At 120,000 kilometres, the system will recover its costs within one year once the bill is enacted. HDVs that cover 50,000 toll-road kilometres per year will have recouped their investment after 2.5 years.

The engine and powertrain of an HDV are designed for a long service life. There is therefore no reason to take older vehicles out of service if they do not have several hundred thousand kilometres on the odometer. Furthermore, not every vehicle reaches high mileage, becoming obsolete overnight – despite the new exhaust classes.

Older commercial vehicles, however, are a thorn in the government's side; they are regarded as "stinkers". With the toll, the government has created an instrument to offer an incentive to purchase more environmentally friendly HDVs, since the lower the Euro classification, the higher the motorway tolls that the HDV owner has to pay.

For operators of older fleets, however, there is an affordable alternative to allow use of the vehicles in a more environmentally friendly way. Also, the chance of obtaining a green emission sticker and thus free access into environmental zones beckons, and the investment will also probably pay off in the future.

Twintec is putting its trust in open filters. According to the manufacturer, an open system does not overheat, since motor oil ash can pass through it and the system does not need additives for regeneration. Even at low exhaust temperatures, when driving in towns, for example, Twintec promises that there is no threat of blockages. The legally mandated particulate filtration rate of at least 50 percent is always ensured, says the manufacturer, as a maximum 90 percent of the particulate matter can be eliminated. Servicing of the system is not necessary.

The competition takes a different path. Closed filters work with filtering rates of up to 99.9 percent and can sometimes trim even Euro 1 and Euro 2 HDVs down to PMK 2. However, closed filter systems do become clogged and require constant regeneration. The tenacious motor oil ash alone resists the renewal process. This results in the filters requiring cleaning in the workshop at regular intervals.

Pirelli Eco Technology has settled on such a system, with a filtration rate of up to 95 percent. Prototypes of the Feelpure filter are currently running in test facilities. Pirelli Germany's marketing manager Thomas Kaltwasser wants to have an ABE under his belt by December. The manufacturer states that Euro 1, 2 and 3 HDVs equipped with this filter shall be given green stickers and should also be able to climb to PMK 2.

The Pirelli system works with an additive, whereby one litre of this is injected into 1,000 litres of fuel. The advantage of the system, according to Kaltwasser, is that filter regeneration functions even during in-town trips with low exhaust temperatures. The additive injected into the filter chambers works as an ignition accelerator.

The additive must be refilled. Tanks can be obtained in sizes of five to 20 litres. With the largest tank, an HDV can travel about 61,000 kilometres. Five litres of additive costs 66 Euros, according to the manufacturer. The system must be serviced after every 100,000 kilometres, says Kaltwasser. The Feelpure filter costs up to 7,000 Euros.



Various retrofit models filter practically all particulate matter from exhaust gases



The Twintec filter takes the place of the silencer

Another manufacturer producing closed systems is Diesel-Exhaust-Systems (DES). In a sintered metal filter, particulate matter settles on the chamber walls.

According to the manufacturer, the use of sintered metal allows for particularly long service intervals of up to 160,000 kilometres, due to the high ash storage capacity. As a result of cleaning, 99 percent of all particulate matter disappears. The filter also functions without additives, since it has a so-called CRT system (Continuously Regenerating Technology). The DES system costs from 6,000 to 8,000 Euros.

The American company Clean Diesel Technologies (CDT) made its debut at the IAA in Germany. Klaus Schmidt directs operations in this country and has signed an attractive sales partner in EnBW. This energy supplier also acts as a trials partner and has fitted some of its own older Mercedes Atego and Unimog models with the ECDPF-1 filter, making them fit for environmental zones.

With a filtration rate of 99.9 percent, the ECDPF-1 also upgrades Euro 1 to 3 HDVs to meet the requirements of PMK 2, according to the manufacturer.

An ABE still needs to be obtained, but should follow soon. The maintenance interval is 60,000 to 100,000 kilometres, says Schmidt. An additive is necessary for the regeneration. This is stored in a 2-litre tank. With an admixture ratio of one part additive to 4,000 parts diesel, two litres are sufficient for around 25,000 kilometres. The additive should cost 60 to 70 Euros per litre. The filter and fitting cost from 5,000 to 7,500 Euros.

Huss Umwelttechnik already has an ABE for its DPF. The company has various filter regeneration technologies on offer. Different systems are available depending on the engine performance; systems that use additives or diesel post-injection to burn off residues, or systems that condition the filter while stationary using electrical heating or diesel burners. According to the company, the filtration rate for all the systems is 99 percent.

Thomas Rosenberger

ON OFFER		
Manufacturer	HDV types	PMK* 2
Clean Diesel Technologies (CDT)	ABE application submitted for motors of all makes with 1.1 l displacement/cylinder	from Euro 1
Diesel Exhaust Systems (DES)	Mercedes Actros, Axor, Atego and Econic, ABE available for further vehicle types	from Euro 3, planned from Euro 2
Huss	Mercedes Atego, Axor and Econic, VTA for motors of all makes with 1.1 displacement/cylinder	from Euro 3
Pirelli Eco Technology	ABE application submitted for motors of all makes with 0.6 to 2 l /cylinder	from Euro 1
Twintec	Mercedes Actros, MAN TGA, Volvo FM/FH, Scania Series 4 and R R,T, DAF CF75/85 and XF95, Iveco Eurostar and Stralis	from Euro 3
PMK: Particle Reduction Class	HDV types represent only a selection. Source: manufacturers	

EURO 5 AND EEV RETROFITTED

»Twinblue« is the name of a combination of particulate filter and SCR technology manufactured by Twintec. This system is said to clean the exhaust gas from Euro 3 HGVs and thus enable classification as Euro 5. At the IAA, Twintec presented a Twinblue prototype for the MAN TGA. First the exhaust gas flows through several filters, in which the particulate matters are trapped. Gaseous pollutants such as carbon monoxide and hydrocarbons are oxidised. In a second stage, nitrogen oxide molecules and residual particulate matter flow through downstream filters and are precipitated. A dosing unit then injects Adblue into the flow of exhaust gas, and this results in the production of ammonia. In the SCR catalytic converter, this transforms nitrogen oxides into nitrogen and water. The filter regenerates itself continuously so that it does not become blocked. DES has also developed a particulate filter with SCR technology that lifts Euro 3, 4 and 5 HGVs up to EEV standard. It also combines a particulate filter with SCR technology and is said to reduce not only particulate matter but also nitrogen oxides by up to 90 percent. Huss Umwelttechnik also claims to produce an SCR system for retrofitting.