Mercedes-Benz Citaro G hybrid buses ready for the road

The first new Citaro hybrid buses, which are gradually going into service, will be used to carry passengers on inner-city routes in Stuttgart. Based on the hybrid technology recently unveiled by Mercedes-Benz, the vehicles claim a fuel saving of up to 8.5%. In late 2018, the Citaro hybrids are then due to switch to the new X1 express bus service introduced by SSB especially for low-emission buses with innovative powertrain technology.

"The objective with the Citaro hybrid is to make the diesel engine even more economical while optimising the degree of electrification for maximum overall economic efficiency," says Rüdiger Kappel, sales manager Mercedes-Benz Buses Germany, explaining the concept behind the vehicles. A disc-shaped electric motor is positioned between the engine and the automatic transmission.

On overrun or when the bus is braking, the energy recovery phase, the motor acts as a generator to produce electric power, which is briefly stored by the Citaro hybrid in capacitors, so-called mild hybrid storage (MHS). When the bus accelerates again, the electric motor uses the stored energy to assist the diesel or gas engine with extra torque. The electric motor has a maximum output of 14kW with a torque of 220Nm.

On acceleration and as the vehicle pulls away, the combustion engine needs to deliver significantly less power thanks to the electric support. This saves fuel. The electric motor also provides assistance at idle.

With regard to the components installed, the manufacturer has intentionally opted for in-house large-scale production. For example, the electric motor serves as a starter-alternator in the current S-Class, while the additionally required cooler for the motor and inverter is used by Mercedes-Benz Trucks and the water pump can be found in many Mercedes-Benz cars.

Steering on demand

Another innovation that benefits overall economic efficiency is "intelligent eco steering". This electrohydraulic steering cuts in only when required, i.e. when the driver turns the steering wheel. In a conventional hydraulic steering system, the assistance is permanently in operation. This means that intelligent eco steering saves fuel. The new steering system is installed as standard in the Citaro hybrid.

Low-voltage technology for easy maintenance

The electric support lightens the load on the combustion engine while also taking work off the brakes during deceleration, which prolongs their service life.

Besides the series-produced parts used for the electric motor, energy storage and cooling, the absence of high-voltage technology is another key factor. The 48 V system is classed as low-voltage technology and can be handled without risk of injury. The ancillary components remain unchanged and are driven conventionally.