



# Technical Information

## The range extender

### General information

The range extender (Figure 1) is used, in many applications, including in electric vehicles (e.g. Opel Ampera, Chevrolet Volt, BMW i3).

It is an additional unit that extends the range of the electric vehicle.

Range extenders usually take the form of internal combustion engines, which drive an alternator in order to supply the electric motor and accumulators with current.



Figure 1

### Function

In the serial hybrid system (Figure 2), the mechanical energy generated by the internal combustion engine is not used directly to drive the vehicle. Instead, it drives an alternator that supplies power to the electric motor and the accumulators. By decoupling the range extender from the mechanical drive train, the unit can be operated in an efficient torque-speed range.

The maximum driving performance (top speed and acceleration) are achieved exclusively using the power supplied by the battery.

If the charge condition of the battery reaches a critical point, the range extender is activated automatically and thus supplies the energy required for the electric drive.

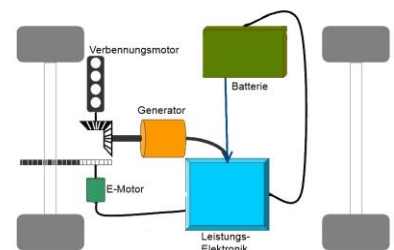


Figure 2

### Causes of failure

As with any conventional internal combustion engine, the causes of failure may be as follows:

- Lack of fuel
- Mechanical damage
- Electronic damage