



With a total weight of up to 26 tonnes, the Volvo FE Hybrid has all the resources for efficient distribution and refuse collection. The electric motor is normally used at start-up and when accelerating to speeds of up to around 20 km/h. It is also used at short stretches, idle running, traffic jams, marshalling, loading and unloading. The diesel engine is shut off completely during electrical operation.

Because the electric motor provides maximum power directly on start-up, the torque and driveability are extremely good. At braking, the brake power is used to charge the batteries, energy that would otherwise have been lost as heat energy in the brakes.

The parallel hybrid runs on a prop shaft

Volvo's hybrid solution is a parallel hybrid. It is a reliable construction because the diesel and electric motors can be used independently of each other. The parallel hybrid runs on a prop shaft, the advantage of which is that disruptions to any of the systems do not affect the other system.

Engines that complement each other

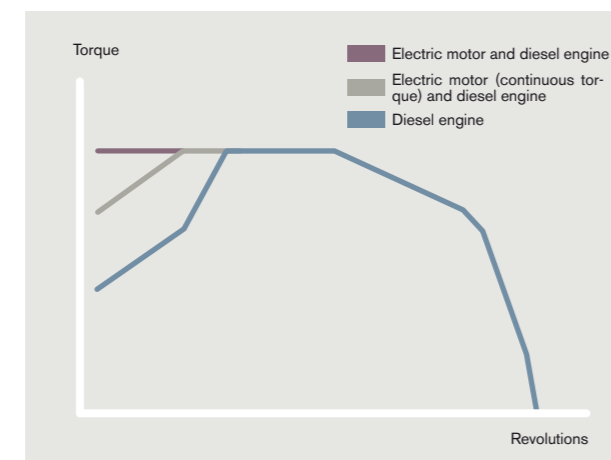
The compact electric motor with its powerful torque offers high performance at low speeds and complements the diesel engine's superior qualities at higher speeds.

Weight is also cut by combining electric motor and generator in the same component. The utility functions do not need to be run by the diesel engine transmission and can therefore be better positioned in the vehicle. The Volvo FE Hybrid servo-unit pumps are run on separate electric motors.

Volvo FE Hybrid

- Fuel saving of 15-30% depending on application
- Powerful, easy to drive and flexible
- Lower exhaust emissions
- Lower noise levels
- Recuperates braking energy
- Reduced wear on the wheel brakes

The hybrid provides an even power flow directly from start-up



VOLVO

Volvo Truck Corporation
www.volvotrucks.com

A CLEAN AND PROFITABLE SOLUTION FOR THE FUTURE

Volvo Trucks has more than twenty years' experience of hybrid technology. The first hybrid solution for heavy vehicles was presented as far back as 1985. Since then Volvo has led the developments and is now launching the Volvo FE Hybrid – a hybrid truck for distribution and refuse collection.

The Volvo FE Hybrid proves that low emissions are easily combined with high transport capacity. The two power sources enable the truck to optimise driving depending on the surroundings.

Large fuel savings and environmental gains

The driveline is a fuel-efficient 7-litre diesel engine along with a powerful electric motor that also functions as a generator. In electric motor mode the truck is completely emissions-free and very quiet.

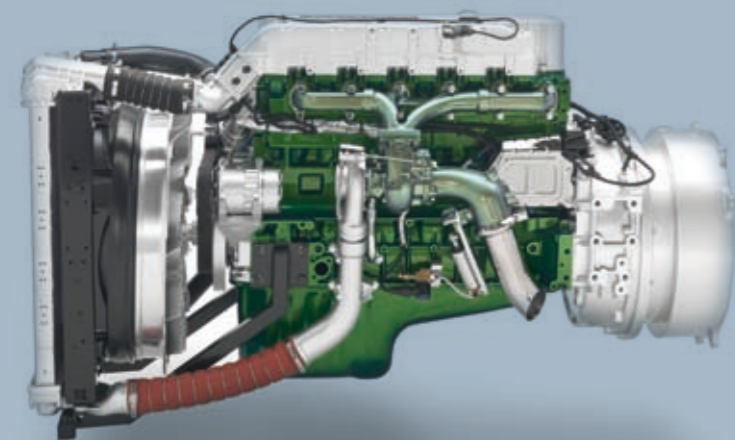
Test drives have shown a fuel saving of 15-20% for distribution driving and a whole 15-30% for refuse collection depending on the bodybuilding solution chosen. Field tests are now underway to verify the test results. It is in urban operations that the hybrid qualities really come to the fore. In

the long term, the technology will get a broader application area as it moves into other areas of application such as long-haul transports.

Environmental and carbon dioxide neutral transports

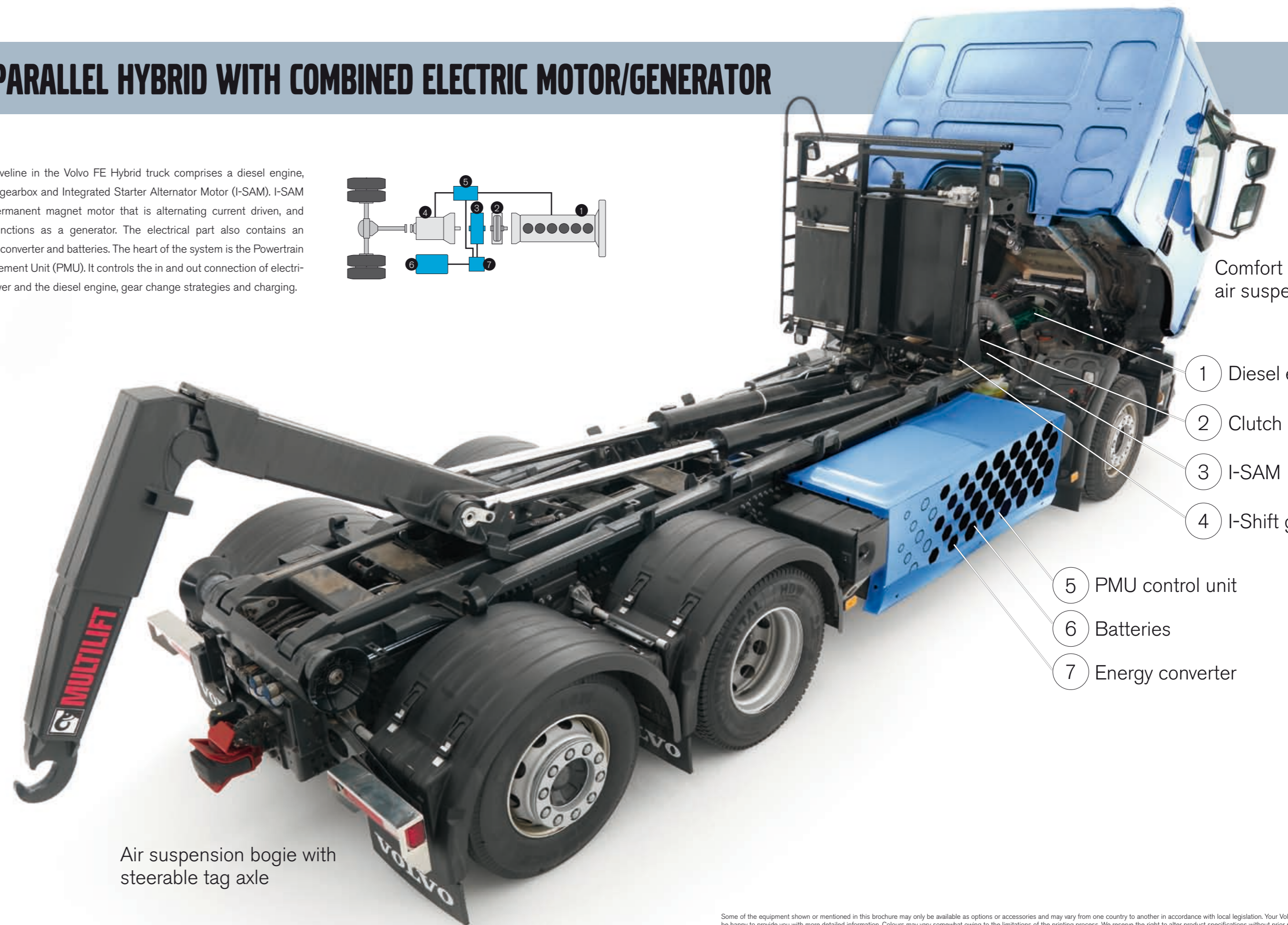
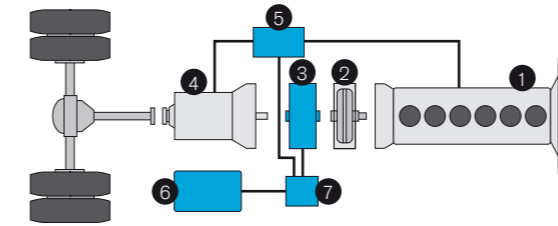
The Volvo hybrid is a tangible solution for environmentally suitable transport operations. Reduced fuel consumption reduces the corresponding amount of carbon dioxide emissions.

The diesel engine has the potential to be run on renewable biofuel. This makes transport work completely carbon dioxide neutral, which paves the way for sustainable transports. Volvo's hybrid technology is already an alternative to natural gas. Natural gas operation and diesel hybrid operation are environmentally similar but the hybrid is more reliable and economically more advantageous.



A PARALLEL HYBRID WITH COMBINED ELECTRIC MOTOR/GENERATOR

The driveline in the Volvo FE Hybrid truck comprises a diesel engine, clutch, gearbox and Integrated Starter Alternator Motor (I-SAM). I-SAM is a permanent magnet motor that is alternating current driven, and also functions as a generator. The electrical part also contains an energy converter and batteries. The heart of the system is the Powertrain Management Unit (PMU). It controls the in and out connection of electrical power and the diesel engine, gear change strategies and charging.



Comfort cab with air suspension

1 Diesel engine D7

2 Clutch

3 I-SAM

4 I-Shift gearbox

5 PMU control unit

6 Batteries

7 Energy converter

Air suspension bogie with steerable tag axle

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