VOLVO

Press Release

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Crash-tested C30 Electric on display - Volvo first to show the world how a safe electric car looks after a collision

Volvo Cars has spotlighted the important issue of electric car safety in an unusual, but distinctive way.
The company is touring the world's motor shows with a Volvo C30 Electric that has undergone a frontal collision test at 64 km/h (40 mph).
"Our tests show it is vital to separate the batteries from the electric car's crumple zones to make it as safe as a conventional car. In Detroit we are the first car maker to show the world what a truly safe electric car looks like after a collision with high-speed impact," says Volvo Cars' President and CEO Stefan Jacoby.

With climate change in focus, interest in electric cars has increased considerably. The electric motor is almost four times more energy-efficient than a combustion engine - and if the electric car is recharged using renewable energy it produces virtually no carbon dioxide emissions.
"The C30 Electric meets car buyers' increasing demands for minimised carbon dioxide emissions. However, this can under no circumstances come at the expense of other properties that customers expect of their Volvos. That is why our electric C30 has to be as comfortable, as usable, as fun to drive and as safe as all the other C30 variants," explains Lennart Stegland, director of Volvo Cars' Special Vehicles division.

Batteries and cables intact
The car on show is a Volvo C30 Electric, which had a fully charged battery when it was tested at Volvo Cars' crash test laboratory in early December 2010. The crash was a so-called offset collision in which 40 percent of the front hit a barrier at 64 km/h (40 mph).

"The test produced exactly the results we expected. The C30 Electric offers the very same high safety level as a C30 with a combustion engine. The front deformed and distributed the crash energy as we expected. Both the batteries and the cables that are part of the electric system remained entirely intact after the collision," relates Jan Ivarsson, Senior Manager Safety Strategy & Requirements at Volvo Cars.

Large batteries, small motor
The structure of an electric car differs considerably from that of a conventional car - and the new components pose a number of new safety challenges.
In order to give the Volvo C30 Electric a range of up to 150 km it is necessary to have a battery pack that weighs about 300 kg and this takes up far more space than a conventional fuel tank. Under the bonnet, the combustion engine has been replaced by a more packaging-efficient and lighter electric motor. What is more, the car has a 400 Volt high-voltage electric system.
"Our far-reaching research emphasises the importance of separating the lithium-ion batteries from the car's crumple zones and the passenger compartment. This is the same safety approach we apply with regard to the fuel tank in a conventional car. Another challenge is to reinforce the crumple zones at the front where the smaller motor occupies less space than usual," says Jan Ivarsson.

Well-protected batteries

In the Volvo C30 Electric the batteries are fitted in the traditional fuel tank position and in the tunnel area. The batteries are robustly encapsulated. Beams and other parts of the car's structure around the battery pack are reinforced. All the cables are shielded for maximum protection.
The crash sensor in the car also controls the fuses - and power is cut in 50 milliseconds in a collision by the same signal that deploys the airbags.
The system has several fuses that cut directly if an earth fault is detected, such as a damaged cable coming into contact with the body frame.
In a conventional car, the combustion engine helps distribute the incoming collision forces. In the C30 Electric this task is performed by a reinforced frontal structure that also helps absorb the increased collision energy created as a result of the car's added weight.

Comprehensive test programme
The crash-tested cars are part of a rigorous test programme that also includes a large number of virtual crashes. Individual components and systems are also tested individually.
In addition to frontal full-scale tests, the C30 Electric has been subjected to other accident scenarios such as side collisions and rear-end impacts. The programme also includes front and side collisions with a rigid pole. The aim is to ensure that the car gives its occupants the best possible crash protection in the accident scenarios that are most frequent in real-life traffic.
"For us, the technology behind electric power is yet another exciting challenge in our drive to build the safest cars in the world," explains Jan Ivarsson.

Demo fleet on the way
Volvo Cars' electric car project currently encompasses about 250 vehicles that will be used by a number of companies and authorities.
"Several car makers have launched or are in the process of introducing electric cars onto the market. We are carefully monitoring their progress and note that not everyone is approaching the safety challenges as we are. But for us at Volvo, this issue is crystal clear. We never compromise on our stringent safety demands," says Stefan Jacoby.

Electrification strategy
The Volvo C30 Electric only represents one leg in Volvo Cars' electrification strategy. There are two more. Volvo will introduce a plug-in hybrid in Europe in 2012. It features a diesel engine backing up the electrical motor. This cuts emissions to less than 50g of CO_2 per kilometer. The third leg is to use power hybrids to get better fuel economy from Volvo's new, upcoming generation of downsized engines.
"Personally, I believe that our non-compromise electrical vehicles are one of the most important factors for future success. I can assure you that we will be working hard to please the luxury car buyers in the coming years. We will stand out from the crowd by delivering a distinct, individualist car experience," says Stefan Jacoby.

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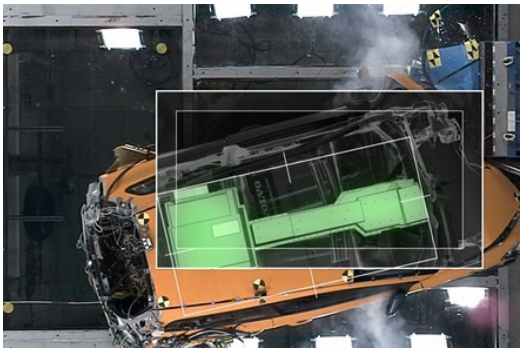

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