

Pure hydrogen fuel cell vehicle

Toyota Motor Co., Japan, is poised to be the first company to offer a pure hydrogen fuel cell vehicle to the public in the near future. The company has unveiled its latest FCHV-5, a fifth-generation experimental vehicle in its fuel cell hybrid series. FCHV-5 makes use of a reformer to extract hydrogen from a still to be developed "clean hydrocarbon" fuel. "Clean" hydrocarbon fuel is a euphemism for petroleum from which sulphur has been removed.

Important system components of the FCHV-5 include a 120 l reformer positioned under the rear seat, a 35 l fuel tank located under the passenger compartment floor, a power control unit, a fuel cell stack, a permanent magnet synchronous motor (all of which are squeezed into the engine compartment) and a rechargeable nickel hydride battery fitted above the rear axle under the rear seat. The reformer module comprises a reformer/catalyser, evaporator, combustor, mixer, heat exchanger, high and low temperature shift catalysers and carbon monoxide remover. The battery pack, supplied by Panasonic EV Energy Co., operates at 288 V. Like all Toyota hybrids, FCHV-5 also employs energy regenerative technology whereby kinetic energy during deceleration and braking is channelled into the vehicle's battery for reuse during acceleration.

Daihatsu Motor, Toyota's small car subsidiary, has also demonstrated a mini fuel cell hybrid vehicle, Move FCV K II, powered by compressed hydrogen and a pure electric vehicle battery. FCV K II's single hydrogen tank is fitted under the rear seat and has a pressure level of 25 MPa. Output from the motor in the front engine compartment is 32 kW. The four-seater vehicle's stack, air compressor and one of two power control units are installed behind the rear passenger seat. The vehicle is equipped with a continuously variable transmission and a rechargeable battery.

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