

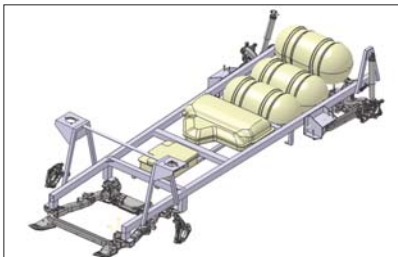
GM "Hydrogen 4" exhibit Case Study

A real-scale rolling chassis of the latest GM hydrogen car -the "Hydrogen 4"-The exhibit explains the hybrid system's main components, in terms of size, position and interconnections. E-motor, battery, hydrogen tanks, DC-DC converter, fuel cell stack, radiator and all main accessories are shown. It will first be displayed on the '08 Geneva Motorshow, where it will represent the main topic of the General Motors booth: the exhibit will be on display together with a real "Hydrogen 4" and several supporting tools for a clear and deep technical communication (all developed by Protoscar), such as virtual animations, CO2 calculators and TechnoLab activities. TechnoLab is an interactive way to explain (and promote) new technologies, innovative fuels or blends and advanced powertrains: using scale models, real hydrogen is produced on the stand and scale hydrogen-car-models are operated, in order to explain the basic functionality of fuel cells. The virtual movies explain the functionality of the system and the typical vehicle's behaviors from an user point of view: at constant speed, starting, overtaking, at downhill and braking. During the Motorshow, specialized Protoscar staff will explain the exhibit and answer all visitor's questions related to alternative fuels vehicles, on behalf of General Motors. The project was done in 2 months.

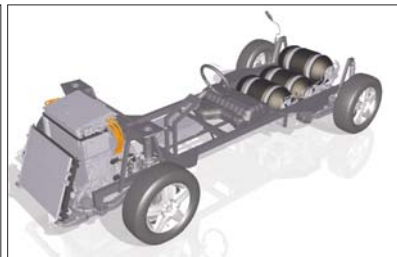
03/08

Protoscar

3D DIGITAL SOLUTIONS



3D modelling



Rendering for concept presentation



Hydrogen 4 before the disassembling



Powertrain components during the disassembling phase



Hydrogen 4 powertrain FC details



Assembled Hydrogen 4 powertrain: front view



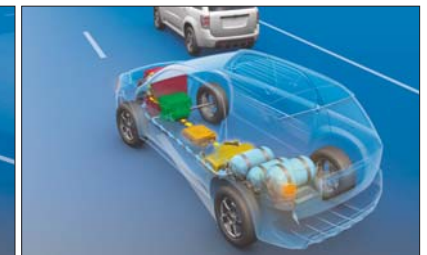
Assembled Hydrogen 4 powertrain: rear view



Virtual animation: main Hydrogen 4 Hybrid components description



Virtual animation: braking GM Hydrogen 4 Hybrid system behavior



Virtual animation: overtaking GM Hydrogen 4 Hybrid system behavior