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## **Modern engines**

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Cars have become an essential part of our everyday life. They are a comfortable means of transport, which saves our energy and time. However, everything has disadvantages, and cars are not an exception. Their emissions pollute our atmosphere and are harmful for people. Scientists all over the world are actively trying to solve this problem. That's why they have invented hybrid and electric engines.

Hybrid engine: a few words about how this new technology works. Hybrid vehicles combine a conventional internal combustion engine (ICE) propulsion system with an electric propulsion system (hybrid vehicle drivetrain). This cocktail is, of course, imperfect, but it has introduced a lot of positive moments in motorists' lives. To begin with, it is necessary to dwell upon the principle of work of hybrid engines. The fuel part of such motor can work together with electric one, but realization of independent cycles is possible either. The electric component being purer and more economic mainly works in a city. The mixed scheme is more often found in Lexus and represents dense interaction of the electromotor and ICE [1].

Necessary to add, that hydrogen engines are being developed these days. Last year, Japan began selling a car Toyota Mirai – the world's first car with a hydrogen engine. The main advantage of a hydrogen car is high environmental friendliness, as the product of hydrogen combustion is water vapor. Of course, other different oils are burnt too, but anyway they are considered less toxic emissions as compared to gasoline exhausts. Motor efficiency of hydrogen fuel is higher

than that of ICE. If to speak about the disadvantages of hydrogen cars, we should mention fuel: it is rather expensive and complicated to produce on an industrial scale. Next: the lack of hydrogen infrastructure, vehicle filling stations. Transportation standards are not developed either, including fuel storage technologies and use of hydrogen fuel. Working on hydrogen fuel cells requires hydrogen power converters and powerful batteries that are heavy and have impressive dimensions. The risk of fire and explosion when working with conventional hydrogen fuel must be mentioned too [2].

Here is another environmentally friendly engine – water engine – the dream of humanity. In 2008, the world was shocked with the news of another engine running only on air and water. At this time, the good news arrived from Japan: Genepax Corporation claimed that only water and air are required for their engine. As in the version of Stan Meyer, an internal combustion engine by Genepax runs on hydrogen, which is released from water. This invention is called the Japanese MEA – Membrane Electrode Assembly. According to Nikkei, Genepax main feature of the system is that it uses a MEA, consisting of a special material, capable of complete splitting of water into hydrogen and oxygen by chemical reaction. There is no need in a special tank for the transportation of highly explosive hydrogen, and therefore the process is less dangerous [3].

References:

1. Mode of access: <http://znanieavto.ru/nuzhno-znat/gibridnye-avtomobili.html>. – Date of access: 28.03.2016.
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