

HYBRIDS

27.1. Vocabulary

Ex. 1. Match the words to their Russian equivalents.

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|---------------------------------------|---|
| 1. plug-in hybrid | a. гибрид |
| 2. lithium ion battery | b. двухрежимный гибрид |
| 3. generator | c. ионно-литевая батарея |
| 4. regenerative braking system | d. бесступенчатая коробка передач |
| 5. two-mode hybrid | e. гибридный автомобиль с подзарядкой от электросети |
| 6. parallel hybrid | f. генератор |
| 7. hybrid | g. рекуперативная тормозная система |
| 8. continuously variable transmission | h. гибридное ТС с силовой установкой параллельного типа |

Ex. 2. Translate the sentences into English.

1. Toyota Prius оснащен бесступенчатой коробкой передач.
2. Наш дом питается от солнечных батарей и генератора на случай отключения электроэнергии.
3. Ford Fusion - популярный гибридный автомобиль, который выбирают водители, заботящиеся об окружающей среде.
4. Модель Tesla S может похвастаться высокоэффективным литий-ионным аккумулятором для поездок на дальние расстояния.
5. Honda Insight предлагает параллельный гибридный двигатель, предлагающий как электрические, так и бензиновые опции.

6. Mitsubishi Outlander PHEV - это подключаемый гибридный автомобиль, который также можно заряжать дома.
7. Система рекуперативного торможения в Chevy Bolt позволяет использовать захваченную энергию для питания аккумулятора.
8. Двухрежимный гибридный Honda CR-Z имеет возможность переключаться с газа на электроэнергию в зависимости от условий движения.

27.2. Reading

Ex. 1. Read the text.

Hybrids

A parallel hybrid is a type of hybrid vehicle and electric vehicle propulsion system that combines a traditional internal combustion engine (ICE) with an electric motor and a battery pack. The term usually refers to a drivetrain in which both the electric motor and the ICE are connected to a common mechanical transmission that drives the wheels. In this configuration, both motors can operate simultaneously and share the load when needed, or operate independently.

The two motors typically have different power characteristics. The electric motor can provide relatively constant torque over its entire speed range, while the ICE's torque is more limited by the choice of gear ratio and the need to keep the ICE operating at an efficient speed range. The continuously variable transmission (CVT) is used to combine the power from the two sources in a controlled manner, taking advantage of the electric motor's ability to produce maximum torque from a standing start, and the ICE's ability to produce torque across its speed range. The combination of these characteristics allows the hybrid vehicle to achieve better fuel economy than a conventional vehicle, particularly in stop-and-go driving.

The regenerative braking system converts kinetic energy into electrical energy during coasting or braking and stores it in the battery pack for later use. This energy can be used to power the vehicle at low speeds, assist the ICE during acceleration, or provide additional power for passing or hill climbing. During deceleration, the ICE can be shut off

completely, allowing the vehicle to operate as a pure electric vehicle, further improving fuel economy.

The battery pack is typically a lithium-ion battery, which has a higher energy density and longer life than the nickel-metal hydride (NiMH) batteries used in earlier hybrid vehicles. The battery is recharged by the generator, which is driven by the ICE and operates as a motor during regenerative braking.

In addition to the parallel hybrid configuration, there are other types of hybrid vehicles, including series hybrids, plug-in hybrids, and two-mode hybrids.

Ex. 2. *Answer the questions.*

1. How does a parallel hybrid vehicle differ from a conventional vehicle?
2. What are the power characteristics of the electric motor and the internal combustion engine (ICE) in a parallel hybrid vehicle?
3. How does the continuously variable transmission (CVT) contribute to the performance of a parallel hybrid vehicle?
4. What is the purpose of the regenerative braking system in a parallel hybrid vehicle?
5. What type of battery pack is typically used in parallel hybrid vehicles, and why?
6. How is the battery pack in a parallel hybrid vehicle recharged?
7. Besides the parallel hybrid configuration, what other types of hybrid vehicles exist?

27.3. Communication

Ex. 1. *Make sentences using the following words:*

1. Hybrid/electricity/gasoline
2. Environment/better/hybrid
3. Cost/hybrid car/how much
4. Cousin/work/drives

5. Money/gas/save
6. Traditional/hybrid car/prefer
7. Switching/hybrid cars/many people
8. Maintain/difficult/hybrid car
9. Government/incentives/hybrid cars
10. Buy/hybrid car/future