

**ELECTRIC DRIVE FOR HYBRID ELECTRIC VEHICLE****Ahmed Ahmed Adel, Vorobiov B.V., Senchenko S.O.***National Technical University «Kharkiv Polytechnic Institute», Kharkiv*

Today in Ukraine there is a large fleet of cars with internal combustion engines. Their number is growing every year. This worsens the environmental situation in the country, increases the need for imported oil and gas fuels. At the same time, European countries are moving to the use of hybrid cars and electric cars.

One of the possible ways to solve this problem is to modernize the existing road transport with a hybrid powertrain. Such modernization involves the dismantling of the flywheel, gearbox, car wheel drive with the installation of one or more electric motors, planetary gearbox, inverter, battery, wheel drive, hybrid drive control system.

The study is based on the design and parameters of the hybrid drive of the Toyota Prius IV. On the base car, it is proposed to leave the serial motor f16d3 in place of the flywheel to install an electric motor/current generator ED1; install a planetary gearbox with traction motor ED2 instead of a gearbox. The drive scheme is shown in Fig. 1.

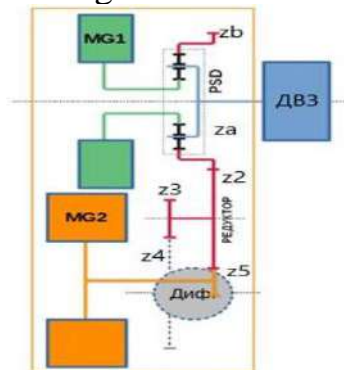


Fig. 1. Scheme of a hybrid drive

The crown gear is used as the drive gear of the planetary gearbox. The shaft of the traction electric motor/generator ED2 with a power of 60 kW and a maximum speed of 6000 rpm is connected to the intermediate gear of the gear transmission. The internal combustion engine is an f16d3 engine with a nominal power of 75 kW at a crankshaft speed of 6000 rpm. A planetary gearbox is used instead of a flywheel and a gearbox.

The crankshaft of the internal combustion engine is connected to the carrier of the planetary gearbox. The electric motor/generator ED1 is connected to the solar gear of the planetary gearbox. The presence of the motor/current generator ED1 is due to the need to charge the battery while driving at acceleration or constant speed. In this case, the wheels rotate from the traction electric motor/generator ED2, and the internal combustion engine drives the shaft of the electric motor/generator ED1.

The scheme of hybrid power plant is developed, the constructive parameters of its elements are substantiated. Empirical dependences of the maximum power of the traction electric motor/generator on the speed are proposed. The modes of operation of electric motors/generators, as well as internal combustion engines as part of a hybrid installation are substantiated, power, torque and speed of rotation of elements of a hybrid installation are determined.