

THS-II (TOYOTA HYBRID SYSTEM-II)

■ DESCRIPTION

1. General

Under the “Hybrid Synergy Drive” concept, the new RX400h uses THS-II (Toyota Hybrid System-II). This system optimally effects cooperative control of a high-output 3MZ-FE engine and a high-speed, high-output MG2 through a hybrid transaxle that provides excellent transmission performance. Furthermore, this system uses a high-output HV battery with a nominal voltage of DC 288V, and a variable-voltage system which supplies the HV battery output voltage to MG1, MG2 and MGR after boosting it and converting it into an alternating current.

2. Driving Performance

- In order to operate MG1 and MG2 powerfully and efficiently, THS-II uses a variable-voltage system that consists of a boost converter and inverter. The boost converter is used to boost the operating voltage of the system to a maximum voltage of DC 650V, and the inverter is used to convert the system voltage (direct current) into an alternating current. By using the variable-voltage system, the electrical loss associated with the supply of electric power at a smaller current is minimized, and MG1 and MG2 are driven at a high voltage. Thus, MG1 and MG2 are operated at high speeds and high outputs.
- A high driving force is achieved through the synergy effect of the high-speed, high-output MG2 and the high-output 3MZ-FE engine.
- This model uses an electric type 4WD system. This system, which consists of an MGR (Motor Generator Rear) in the rear transaxle, drives the rear wheels in accordance with driving conditions, thus realizing a high driving force.

3. Fuel Economy Performance

- By optimizing the internal construction of the MG2 and MGR, this system realizes a high level of regenerative capability, thus realizing a high level of fuel economy performance.
- This system stops the engine while the vehicle is idling, and stops the engine as much as possible under conditions in which the operating efficiency of the engine is poor, allowing the vehicle to operate using only MG2 or MG2 and MGR. Under the conditions in which the operating efficiency of the engine is favorable, the engine operates to drive the vehicle using MG1 while generating electricity. Thus, this system effects the input-output control of driving energy in a highly efficient manner to realize a high level of fuel economy.