4WD-i SYSTEM

■ DESCRIPTION

The 4WD-i system uses MGR (Motor Generator Rear) in the rear drive unit to directly drive the rear wheels. This system is controlled by the hybrid vehicle control ECU. According to the driving conditions of the vehicle, the hybrid vehicle control ECU linearly effects distribution control to attain an optimal front-rear torque distribution that provides the drive force required by the vehicle as a whole. Therefore, this system realizes a high level of fuel economy and traction performance under various conditions, realizing excellent driving stability.

■ FEATURES OF THE 4WD-i SYSTEM

Item	Outline
Starting-off	On a slippery road surface, after the hybrid vehicle control ECU calculates the required total motive force, the skid control ECU calculates the motive force that the wheels can transmit and the torque distribution between the front and rear wheels, and transmits signals to the hybrid vehicle control ECU.
Normal Driving	• Generally, the system stops the driving of the rear wheels during normal driving to ensure fuel economy performance. • If the vehicle is being driven on a slippery road surface, if it accelerates, or makes a tight turn, the skid control ECU detects this based on the signals provided by various sensors. Then, the skid control ECU calculates the torque distribution between the front and rear wheels, and transmits signals to the hybrid vehicle control ECU. Upon receiving these signals, the hybrid vehicle control ECU appropriately drives the front and rear wheels, in order to achieve traction performance while ensuring driving stability.
Decelerating	When the vehicle is decelerating, kinetic energy is recovered from the front and rear wheels by means of MG2 and MGR, converted into electrical energy, and used for recharging the HV battery. This contributes to fuel economy performance.