■FUNCTION OF MAIN COMPONENTS

Item			Outline
Hybrid Transaxle	MG1		• MG1, which is driven by the engine, generates high-voltage electricity in order to operate MG2 and MGR and/or charge the HV battery. Also, it functions as a starter to start the engine. • MG1 is operated so that the gear ratio of the power split planetary gear unit will optimally suit the driving conditions of the vehicle.
	MG2		• Driven by electrical power from MG1 and/or the HV battery, it generates motive force for the front wheels. • During braking, or when the accelerator pedal is not depressed, it generates electricity to recharge the HV battery (Regenerative braking).
	Compound Gear Unit	Power Split Planetary Gear Unit	Distributes the engine drive force as appropriate to directly drive the vehicle as well as MG1.
		Motor Speed Reduction Planetary Gear Unit	Located between MG2 and the power split planetary gear, the motor speed reduction planetary gear reduces the rotational speed of MG2 in order to increase torque.
	Resolver		• MG1, MG2 and MGR are each equipped with a resolver. • Sends the rotational speed of the motor to the MG ECU.
	Temperature Sensor		• MG1, MG2 and MGR are each equipped with a temperature sensor. • Measures the temperature of MG1, MG2 and MGR.
Rear Drive Unit	MGR		• Driven by electrical power from MG1 and/or the HV battery, it generates motive force for the rear wheels. • During braking, or when the accelerator pedal is not depressed, it generates electricity to recharge the HV battery (Regenerative braking).
Inverter with Converter Assembly	Inverter		A device that converts high-voltage DC (HV battery) into AC (MG1, MG2 and MGR) and vice versa (converts AC into DC).
	Boost Converter		Boosts the voltage of the HV battery from DC 288V to a maximum of DC 650V and vice versa (drops DC 650V to DC 288V).
	DC-DC Converter		Drops the HV battery voltage of DC 288V into DC 14V (approx.) in order to supply electricity to body electrical components, as well as to recharge the auxiliary battery (DC 14V).
	MG ECU		• Controls the inverter and boost converter in accordance with signals received from the hybrid vehicle control ECU, thus operating MG1, MG2, or MGR as either a generator or motor. • Controls the DC-DC converter in accordance with the signals received from the hybrid vehicle control ECU.

(Continued)

Item	Outline
Hybrid Vehicle Control ECU	Performs comprehensive control of the THS-II system. This includes the engine, electric continuously variable transmission and HV battery. • Information from various sensors as well as from ECUs (battery smart unit, MG ECU, skid control ECU, and power steering ECU) is received, and based on this the required torque and output power is calculated. The hybrid vehicle control ECU sends the calculated result to the MG ECU and skid control ECU. • Controls the ETCS-i (Electronic Throttle Control System-intelligent) in accordance with the target engine speed and required engine motive force. • Monitors the SOC (State Of Charge) of the HV battery. • Controls the HV battery cooling fans.
HV Battery	• Supplies electrical power to MG1, MG2, and MGR in accordance with the driving conditions of the vehicle. • Is charged by MG1, MG2, and MGR in accordance with the SOC and the driving conditions of the vehicle. • Has a nominal (approximate) voltage of DC 288V (actual voltage will vary depending on various conditions such as temperature, charge or discharge).
Battery Smart Unit	• Monitors HV battery conditions such as voltage, temperature and current, and transmits this information to the hybrid vehicle control ECU. • Monitors the HV system for breakdown of the electrical insulation.
Skid Control ECU	• During braking, it calculates the regenerative braking force that is required and transmits it to the hybrid vehicle control ECU. • Calculates the motive force that is required during the operation of TRAC or VSC and transmits it to the hybrid vehicle control ECU. • Transmits a front and rear wheel torque distribution request to the hybrid vehicle control ECU for the purpose of 4WD-i system control.
Accelerator Pedal Position Sensor	Converts the accelerator pedal position into an electrical signal and outputs it to the hybrid vehicle control ECU.
Shift Lever Position Sensor	Converts the shift lever position into electrical signals and outputs them to the hybrid vehicle control ECU.
SMRs (System Main Relays)	Connect and disconnect the high-voltage power circuit between battery and inverter with converter assembly. The hybrid vehicle control ECU controls the SMRs by turning them on or off as appropriate.
Interlock Switch (For Inverter Cover and Service Plug Grip)	Verifies that the both the inverter cover and the service plug grip have been installed.
Circuit Breaker Sensor	Detects an impact that is applied to the vehicle during a collision and transmits a signal to the hybrid vehicle control ECU. Upon receiving this signal, the hybrid vehicle control ECU operates the SMRs (System Main Relays) to shut down the power supply.
Service Plug Grip	Removed to open the internal high-voltage circuit of the HV battery for vehicle inspection or maintenance.