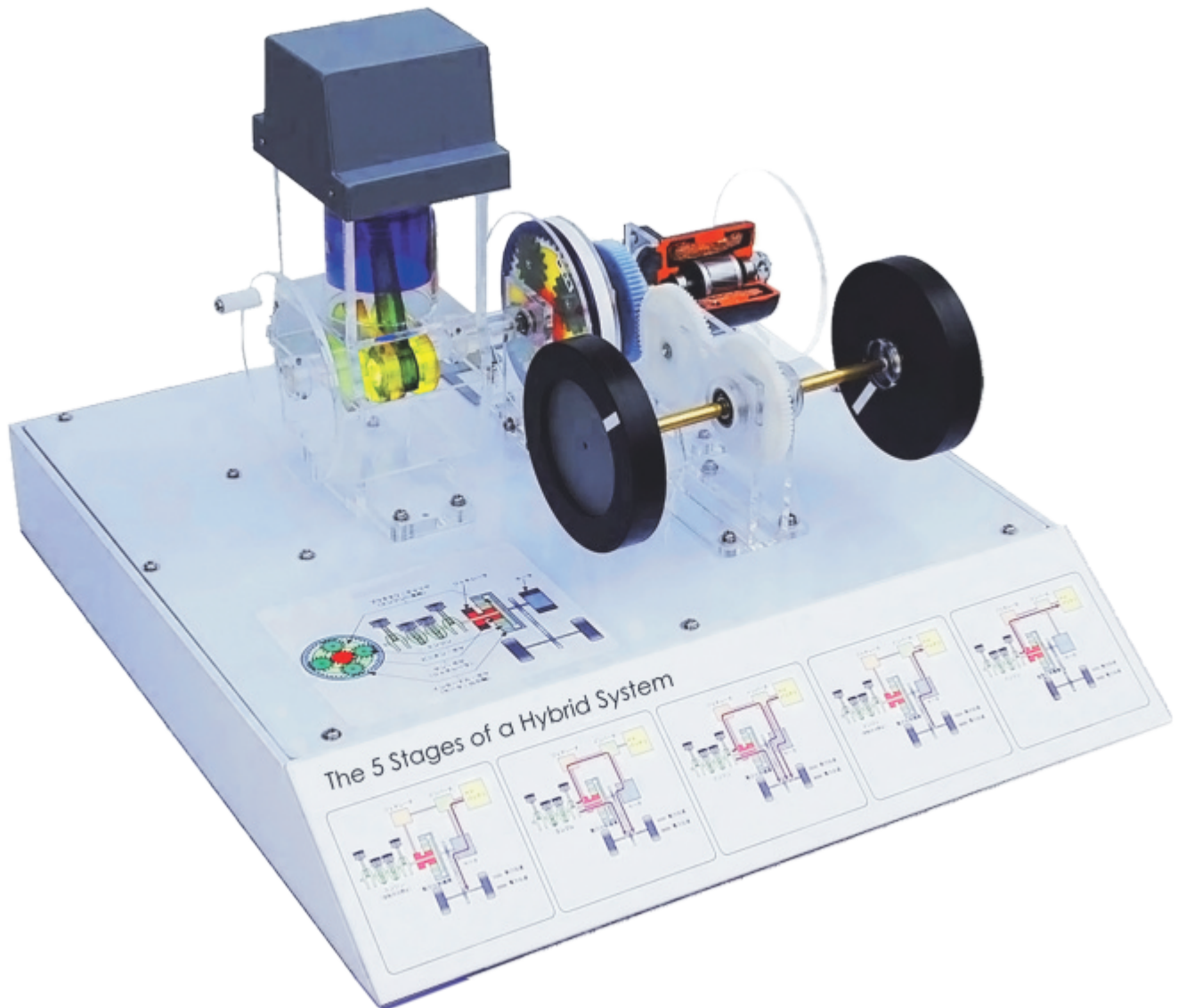




HYBRID SYSTEM MODEL

N98-V501-HBD

Maintenance and Operation



IMPORTANT!

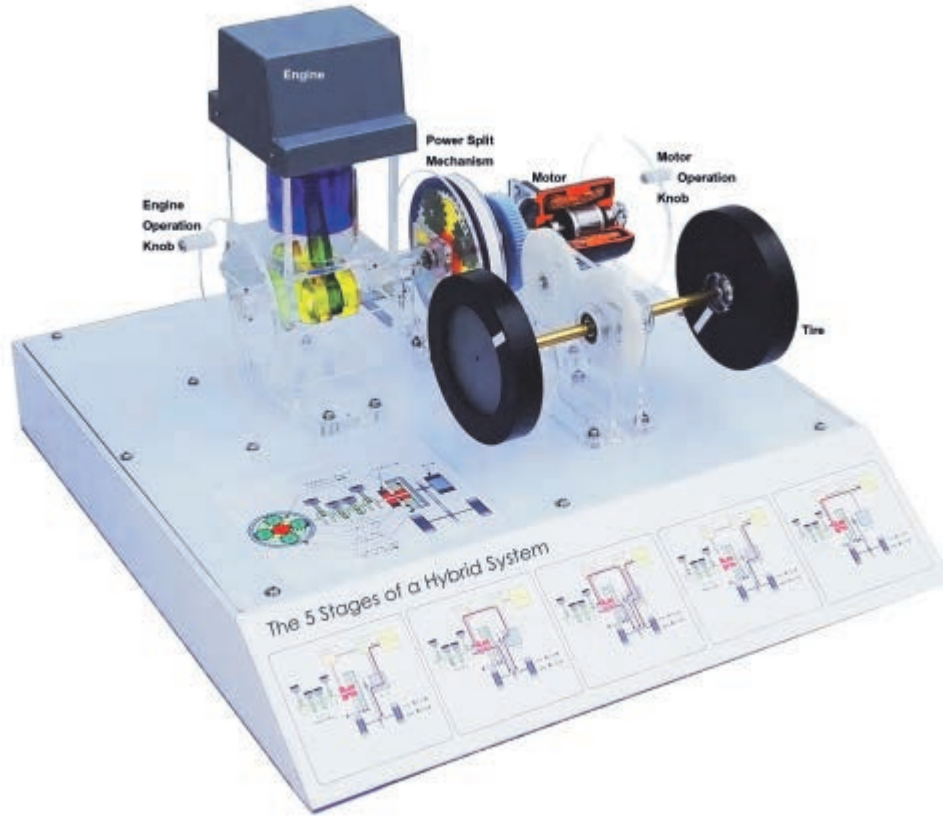
Read the following before using this equipment:

Carefully follow all instructions and observe all precautions given in this manual.
Handle moving parts with care. Clean with a soft cloth and fuel alcohol.

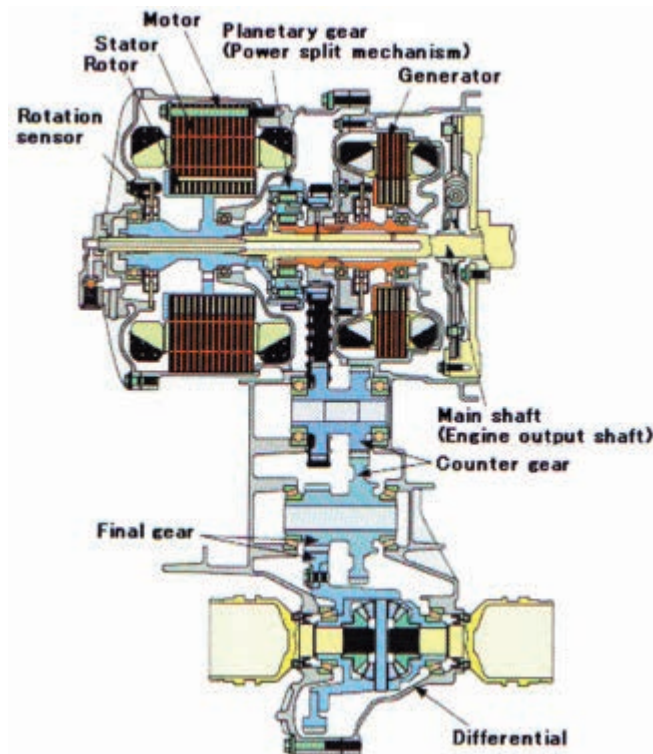
HYBRID SYSTEM MODEL

N98-V501-HBD

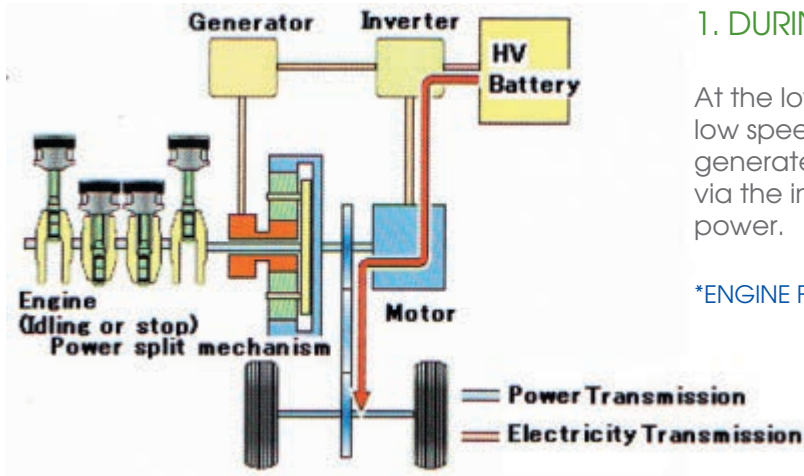
This unit is a 3-dimensional model of a parallel series Hybrid System employed in the Toyota Prius. Learning the intricate details within the hybrid system is made easy via the instruction panel located on the front panel. In addition, this model is geared for manual demonstrations and has moving components that emulate the system in action.



TRANSAXLE FOR HYBRID



OPERATION



1. DURING LIGHT ACCELERATION

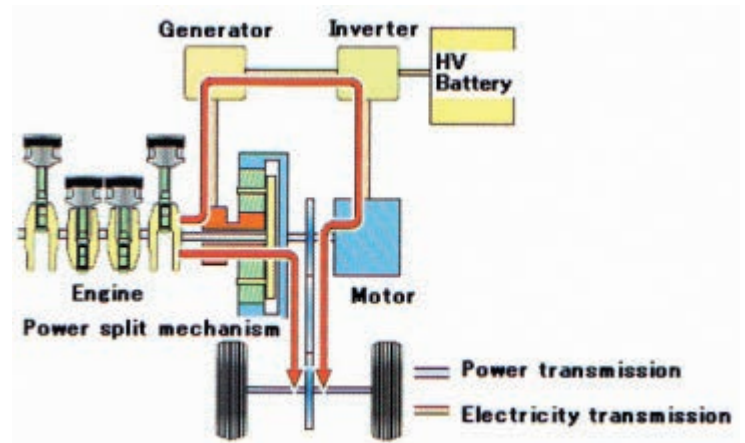
At the low engine efficiency sphere, such as driving at a low speed, the engine stops and the electric power generated by the hybrid battery is supplied to the motor via the inverter. As a result, the vehicle cruises by motor power.

*ENGINE FIXED, MOTOR ROTATES

2. DURING NORMAL DRIVING

The power dividing mechanism divides power from the engine so that one portion powers the wheels while the other portion powers the generator. This mechanism supplies the motor with the necessary driving power. In addition, this controls the power distribution at maximum efficiency.

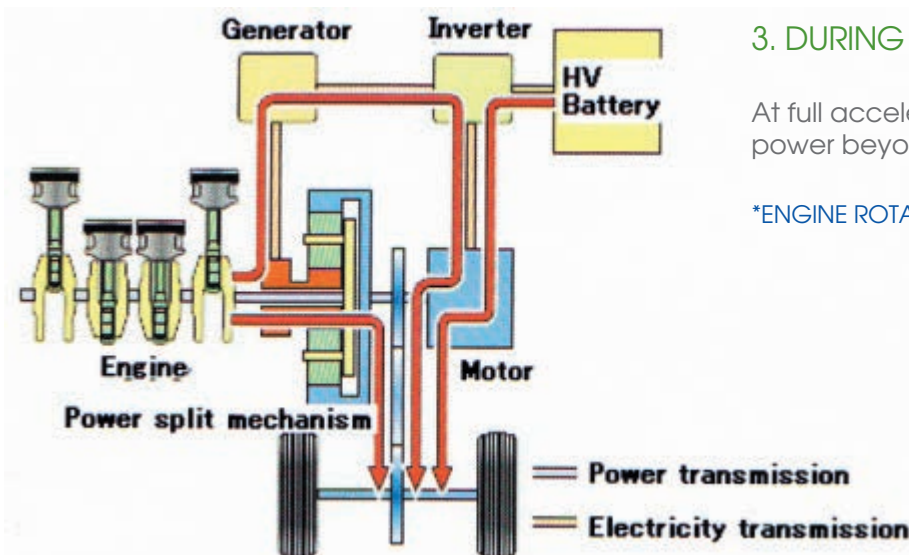
*ENGINE ROTATES, MOTOR ROTATES (SLOWLY)



3. DURING FULL ACCELERATION

At full acceleration, this feature adds additional power beyond the "Cruising" status.

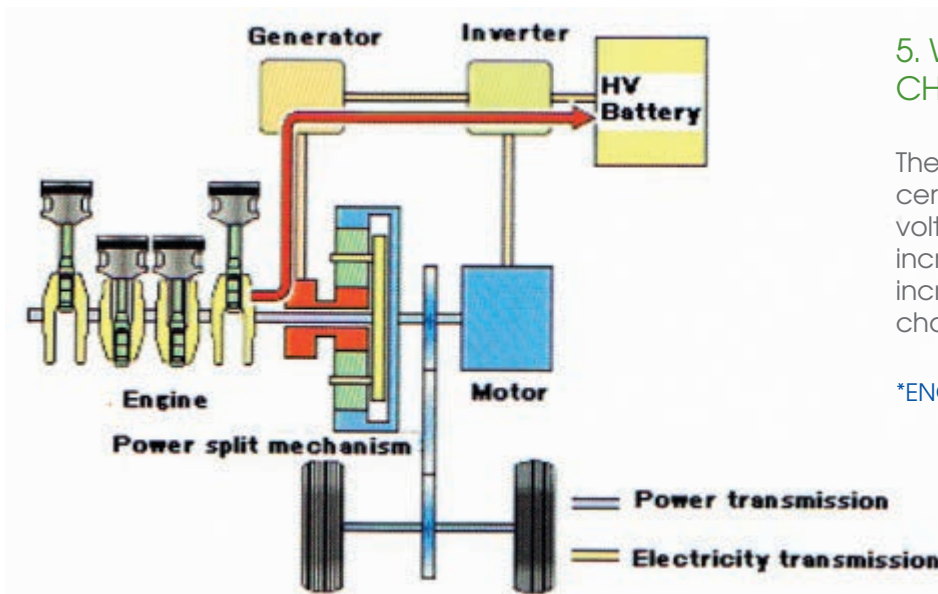
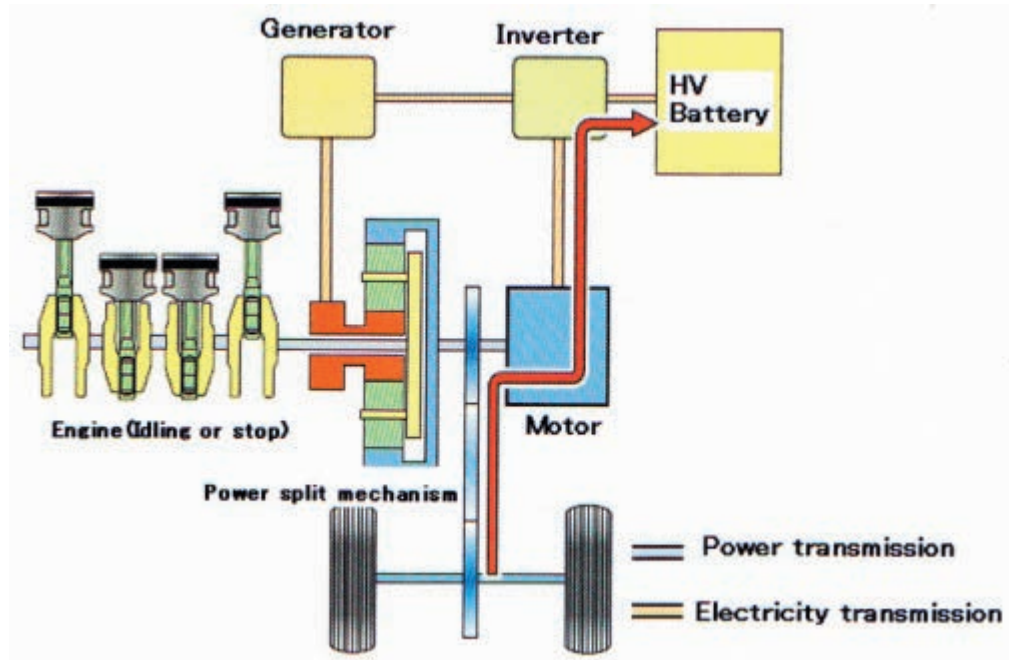
*ENGINE ROTATES, MOTOR ROTATES



4. DURING DECELERATION AND STOPPING

At deceleration and regenerating energy, the motor is used as a generator when the rotation of the wheels generates friction between the road and the wheel, converting kinetic energy into electric energy when decelerating, and recovers (charges) the hybrid battery. When the engine brake and foot brake are employed, the recovery brake system uses the most efficient option. The hydraulic brake supplement enables a more efficient recovery (charging).

*TIRE ROTATES



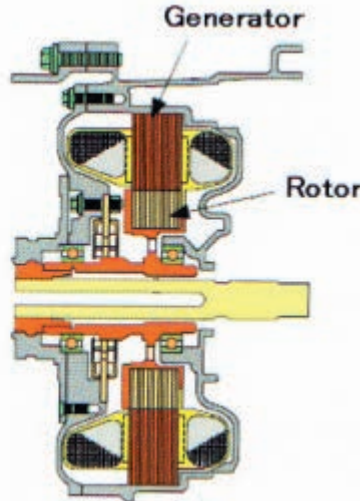
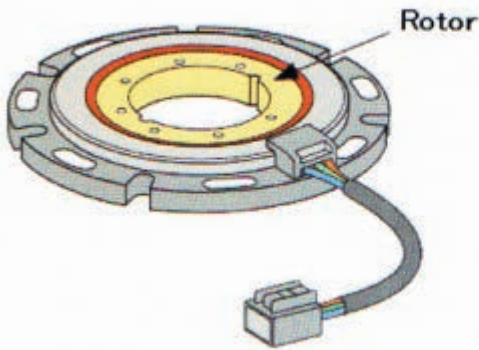
5. WHEN THE HV BATTERY IS CHARGING

The battery is controlled to maintain a certain charge status. When the voltage decreases, there is an increase in engine output that increases electricity generation to charge the hybrid battery.

*ENGINE ROTATES, MOTOR FIXED

GENERATOR

The component generates electricity and supplies the HV Battery to permit charging and driving the motor. The generator varies the quantity of electric power and controls the transaxle of the continuously variable transmission. It also acts as an engine starter.

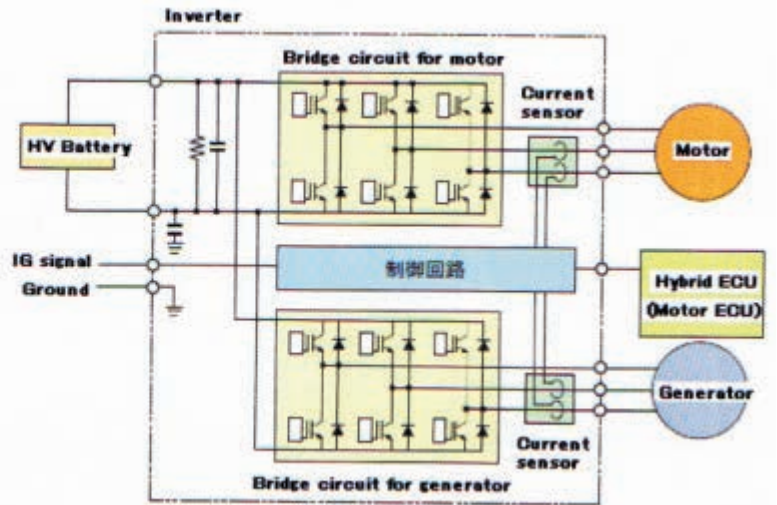
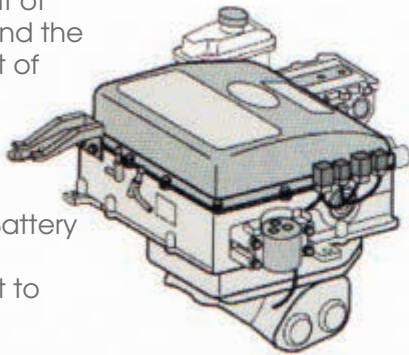


INVERTER

The inverter converts the direct current of the HV Battery and the alternate current of the motor and generator.

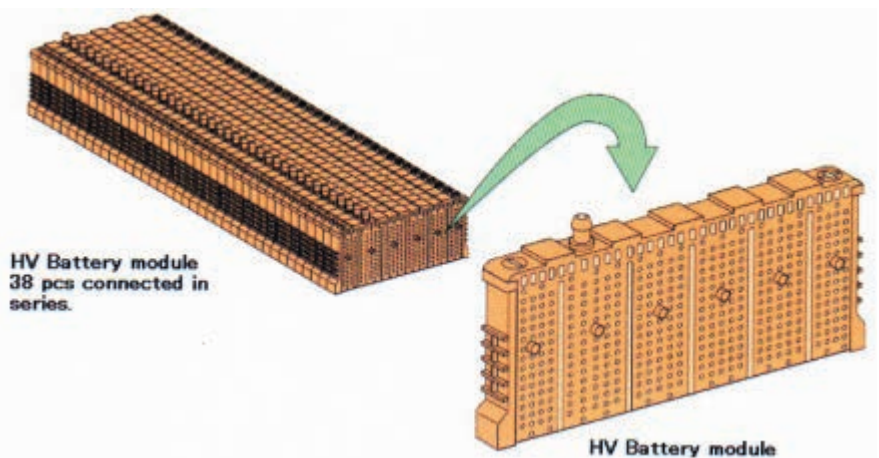
Generator → →
Charged in HV Battery
(converts from
alternate current to
direct current)

HV Battery → → Motor
Drive (converts from
direct current to
alternate current)



HV BATTERY MODULE

The HV Battery module (not included) is a combination of 6 pieces of 1.2V Nickel-Hydrogen batteries connected into one series. When 38 series are connected together, the HV Battery module generates 273.6V.



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