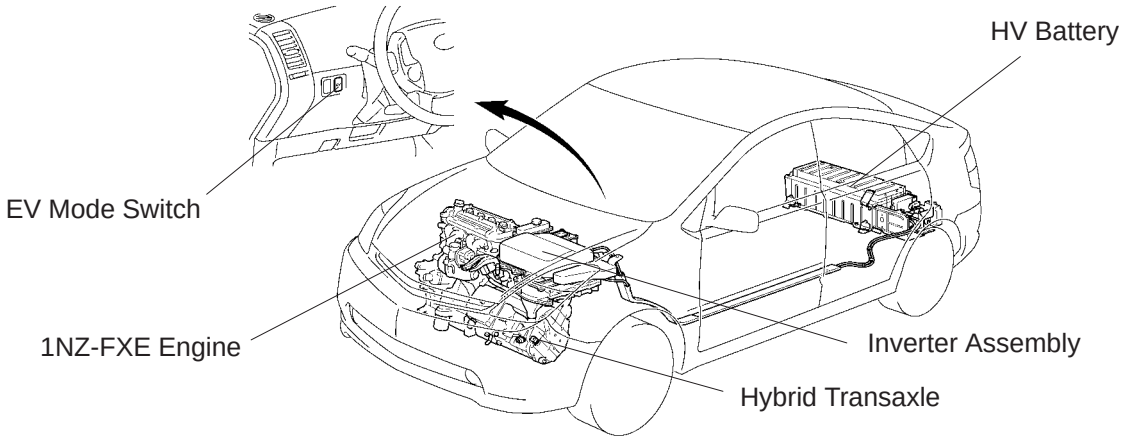
PERFORMANCE

THS-II (TOYOTA HYBRID SYSTEM-II)

- The hybrid system is a type of power-train that uses a combination of two types of motive forces, such as an engine and a motor [MG2 (Motor Generator No.2)]. This system is characterized by its skillful use of two types of motive forces according to the driving conditions. It complements weakness of motive forces each other to maximize the motive force of the vehicle.
- The new Prius is powered by a new-generation Toyota Hybrid System called “THS-II”, which has been developed under a “Hybrid Synergy Drive” concept to pursue better environmental performance and to realize “fun to drive” feeling. Under this concept, the THS-II has achieved significant advances in control systems, which aim for synergy between the power of the electric motor and the power of the engine. By greatly boosting the power supply voltage, this system has achieved a high level of balance between environmental performance and power.
- EV mode drive has been set for the new Prius, which enable to drive only with electric motor. This mode is turned on by pushing EV Mode Switch.



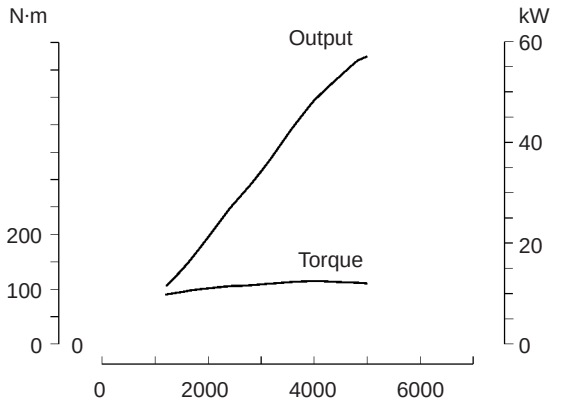
Engine

Model	New Prius	Previous Prius
Type	1NZ-FXE High Expansion Ratio Cycle Engine, Certified European Step IV	1NZ-FXE High Expansion Ratio Cycle Engine, Certified European Step IV
Displacement	1497 cm^3	1497 cm^3
Max. Output	57 Kw/5000 rpm*	53 Kw/4500 rpm
Max. Torque	115 N·m/4000 rpm*	115 N·m/4200 rpm

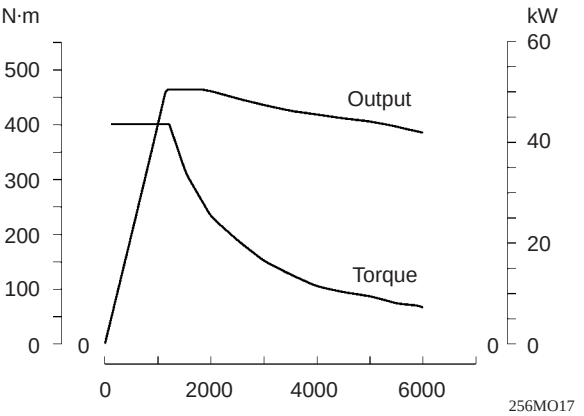
*: SAE-NET

Motor and Generator

Item	MG1	MG2	
		New	Previous
Type	Permanent Magnet Motor	Permanent Magnet Motor	Permanent Magnet Motor
Function	Generate, Engine Starter	Generate, Drive Wheels	Generate, Drive Wheels
Rated Voltage [V]	AC 500	AC 500	AC 273.6
Maximum Output kW (HP)/(rpm)	—	50 (68)/(1200 ~ 1540)	33 (45)/(1040 ~ 5600)
Maximum Torque N·m (ft·lbf)/(rpm)	—	400 (295)/(0 ~ 1200)	350 (259)/(0 ~ 400)

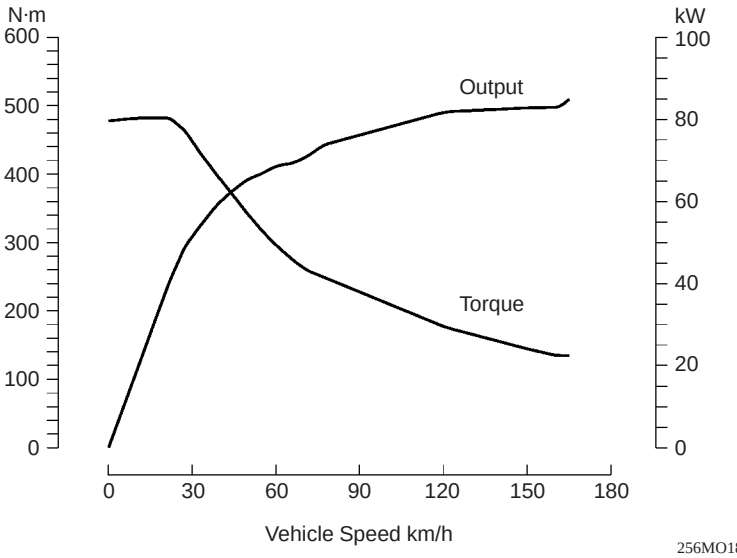


Engine Performance Curve



256MO17

Motor Performance Curve



256MO18

System Performance Curve

Fuel Economy

- The New Prius has achieved 15% reduction in fuel consumption, comparing with the previous models, to be in top level of the world. It is due to the adoption of THS-II and load reduction on the vehicle.
- Improvement Items in THS-II:
  (1) A high-voltage power circuit has been adopted between the motor and the generator, in order to greatly reduce the energy loss during power transmission and deliver optimal energy in an efficient manner.
  (2) As a result of increasing the power output of the motor 1.5 times, the THS-II significantly increases the use of the electrical motor. Under conditions in which the efficiency level of the engine is low, this system stops the engine, allowing the vehicle to run using only the power provided by the electric motor.
  (3) The amount of energy regenerated during deceleration and braking has been significantly increased in order to increase energy efficiency.
- Load Reduction Items on Vehicle:
  (1) Reduction of air resistance
  (2) Reduction of friction at various components: Examples: Engine, transaxle oil, etc.
  (3) Reduction of electrical loads: Example: Adoption of LED stoplight
  (4) Adoption of electric inverter air conditioning system