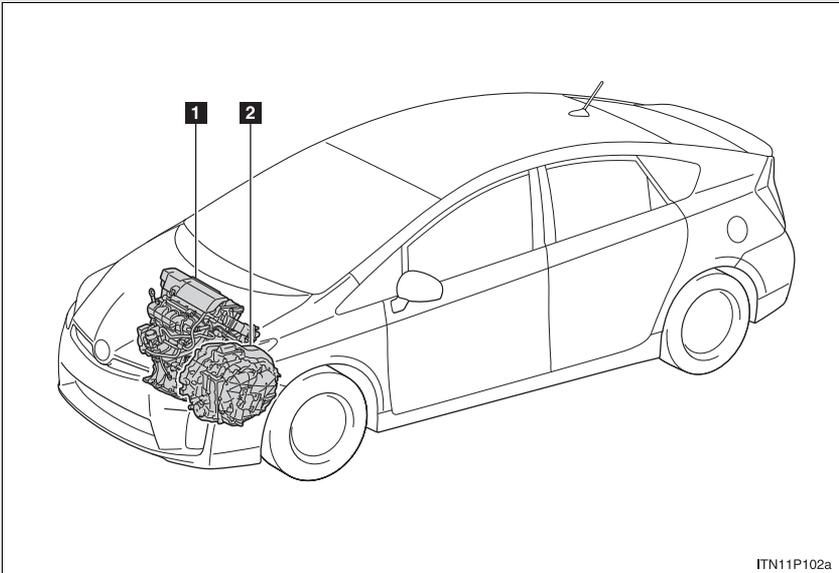


1-1. Hybrid system

Hybrid system

Your vehicle is a hybrid vehicle. It has characteristics different from conventional vehicles. Be sure you are closely familiar with the characteristics of your vehicle, and operate with care.

The hybrid system combines a gasoline engine and an electric motor (traction motor) according to driving conditions, improving fuel efficiency and reducing exhaust emissions.



ITN11P102a

- 1** Gasoline engine
- 2** Electric motor (Traction motor)

n When stopped/during take-off

The gasoline engine stops when the vehicle is stopped. During take-off, the electric motor (traction motor) drives the vehicle. At slow speeds or when traveling down a gentle slope, the engine is stopped and the motor is used.

n During normal driving

The gasoline engine is predominantly used. The electric motor (traction motor) charges the hybrid battery (traction battery) as necessary.

n When accelerating sharply

The power of the hybrid battery (traction battery) is added via electric motor (traction motor) to that of the gasoline engine.

n When braking (Regenerative brake)

The electric motor (traction motor) charges the hybrid battery (traction battery).

n Regenerative braking

The motor generator converts kinetic energy to electric energy when:

- l The accelerator pedal is released.
- l The brake pedal is depressed with the shift lever in "D" or "B".

▫ **Conditions in which the gasoline engine may not stop**

The gasoline engine starts and stops automatically. However, the followings are examples of conditions under which the engine may not stop automatically:

- ┆ The gasoline engine is warming up.
- ┆ The hybrid battery (traction battery) is being charged.
- ┆ The hybrid battery (traction battery) temperature is low or high.
- ┆ The temperature setting of the air conditioning system is high.

▫ **Charging the battery**

┆ As the gasoline engine or regenerative brake charges the hybrid battery (traction battery), the battery does not need to be charged from an outside source. However, if the vehicle is left parked for a long time the hybrid battery will slowly discharge. For this reason, be sure to drive the vehicle at least once every several months for at least 30 minutes or 10 miles (16 km). If the hybrid battery becomes fully discharged and you are unable to jump-start the vehicle with the 12 volt battery, contact your Toyota dealer.

┆ If the shift lever is in “N”, the hybrid battery (traction battery) will not be charged. When driving in heavy traffic, operate the vehicle with the shift lever in “D” or “B” to avoid discharging the battery.

▫ **After the 12 volt battery has discharged or has been changed or removed**

The gasoline engine may not stop even if the vehicle is running on the hybrid battery (traction battery). If this continues for a few days, contact your Toyota dealer.

■ **Sounds and vibrations specific to a hybrid vehicle**

There may be no engine sounds or vibration even though the vehicle is able to move. Always push the “P” position switch when parked.

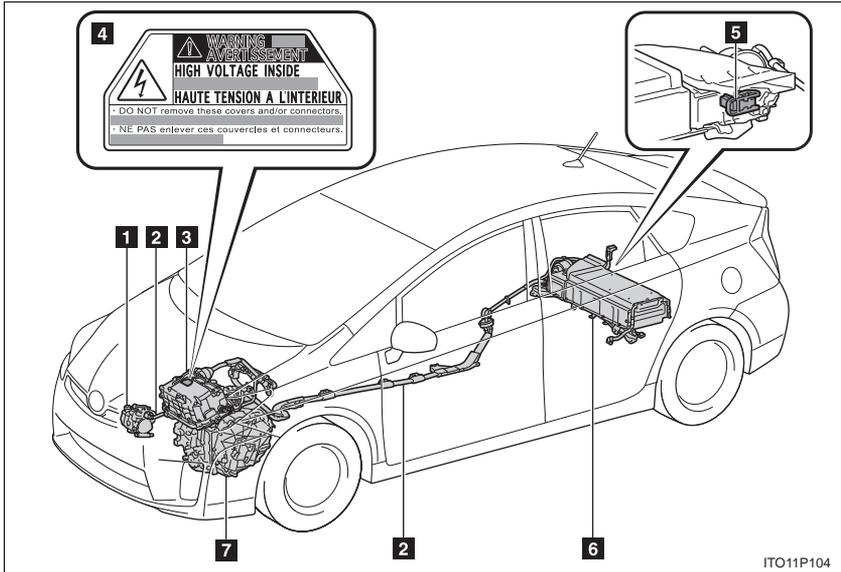
The following sounds or vibrations may occur when the hybrid system is operating, and are not a malfunction.

- ┆ Motor sounds may be heard from the engine compartment.
- ┆ Sounds may be heard from the hybrid battery (traction battery) behind the rear seat when the hybrid system starts or stops.
- ┆ Sounds from the hybrid system may be heard when the back door is open.
- ┆ Sounds may be heard from the transmission when the gasoline engine starts or stops, when driving at low speeds, or during idling.
- ┆ Engine sounds may be heard when accelerating sharply.
- ┆ Sounds may be heard due to regenerative brake when you press the brake pedal or release the accelerator pedal.
- ┆ Vibration may be felt when the gasoline engine starts or stops.
- ┆ You may hear cooling fan sounds coming from the air intake vents behind the rear seat.

■ **Maintenance, repair, recycling, and disposal**

Contact your Toyota dealer regarding maintenance, repair, recycling and disposal. Do not dispose of the vehicle yourself.

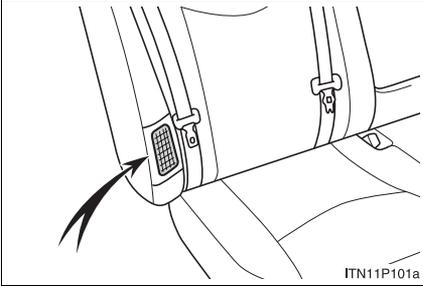
High voltage components



- 1** Air conditioning compressor
- 2** High voltage cables (orange color)
- 3** Power control unit and DC/DC converter
- 4** Caution label
- 5** Service plug
- 6** Hybrid battery (Traction battery)
- 7** Electric motor (Traction motor)

Take care when handling the hybrid system, as it contains a high voltage system (about 650 V at maximum) as well as parts that become extremely hot when the hybrid system is operating. Obey the caution labels attached to the vehicle.

n Hybrid battery air vent



There is an air intake vent on the side of the rear right seatback for the purpose of cooling the hybrid battery (traction battery). If the vent becomes blocked, the hybrid battery may overheat, leading to a reduction in hybrid battery output.

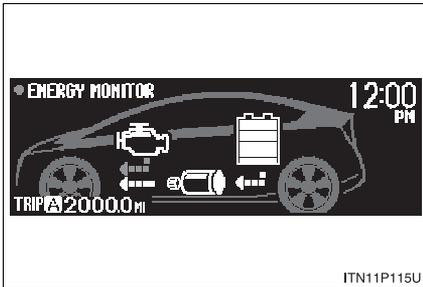
Emergency shut off system

The emergency shut off system blocks off the high voltage current and stops the fuel pump to minimize the risk of electrocution and fuel leakage when a certain level of impact is detected by the impact sensor. If the emergency shut off system activates, your vehicle will not restart. To restart the hybrid system, contact your Toyota dealer.

Eco Drive Monitor

The multi-information display features several screens to assist with environmentally friendly driving. You can drive in an environmentally friendly manner by using these screens effectively.

n Hybrid system operating condition

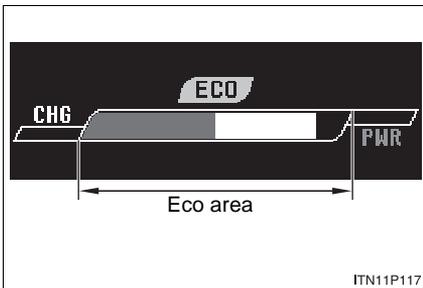


The energy monitor displays the operating condition of the hybrid system, showing such information as the gasoline engine operating status, and the usage and regeneration status of electrical energy. (→P. 190)

n Driving efficiently

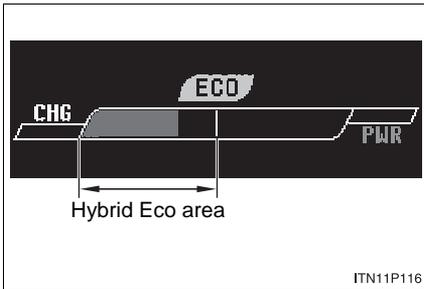
The Hybrid System Indicator changes in real-time in accordance with the driving conditions and operation of the accelerator pedal. Driving that is friendlier to the environment can be achieved by referring to the display and by driving as follows. (→P. 192)

1 When accelerating



Accelerate to the desired speed while depressing the accelerator pedal slowly and ensuring that the indicator bar does not exceed the Eco area.

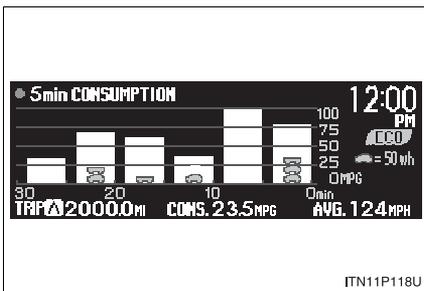
1 When the desired speed is reached



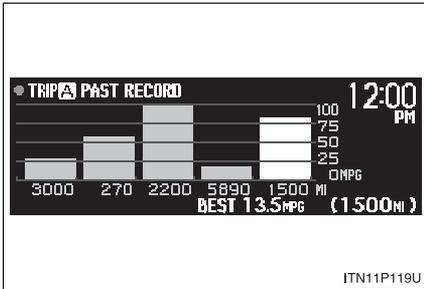
Release the accelerator pedal once. Then, depress the accelerator pedal slowly and drive at a constant speed, keeping the indicator bar within the Eco area.

When aiming to improve fuel economy, try to drive within the Hybrid Eco area. By doing so, the drive force of the Electric motor (Traction motor) will often be used alone without the need for fuel consumption, thus allowing you to enjoy driving with improved fuel economy.

n Checking fuel consumption



The 5-minute/1-minute interval fuel consumption display shows the average fuel consumption and the regenerated energy amount in 5-minute or 1-minute intervals. (→P. 194)



The fuel consumption record display shows a history of the average fuel consumption in sections, based on the driving records of trip meters A and B. Each section represents the interval between each trip meter reset. (→P. 197)

A record of the best consumption is also kept on this screen. The best consumption record is updated whenever a higher record is achieved.

Hybrid warning message

A message is automatically displayed when a malfunction occurs in the hybrid system or an improper operation is attempted.

If a warning message is shown on the multi-information display, read the message and follow the instructions. (→P. 500)

1

Before driving

n **If a warning light comes on or a warning message is displayed, or the 12 volt battery is disconnected**

The hybrid system may not start. In that case, try to start the system again. If the “READY” indicator does not come on, contact your Toyota dealer.

n **Running out of fuel**

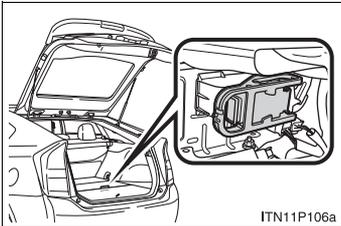
When the vehicle has run out of fuel and the hybrid system cannot be started, refuel the vehicle with at least enough gasoline to make the low fuel level warning light go off (→P. 491). If there is only a small amount of fuel, the hybrid system may not be able to start. (The minimum amount of fuel to add to make the low fuel level warning light go out is about 1.6 gal. [6.0 L, 1.3 Imp.gal.], when the vehicle is on a level surface. This value may vary when the vehicle is on a slope.)

! CAUTION

n High voltage precautions

The vehicle has high voltage DC and AC systems as well as a 12 volt system. DC and AC high voltage is very dangerous and can cause severe burns and electric shock that may result in death or serious injury.

- I Never touch, disassemble, remove or replace the high voltage parts, cables and their connectors.
- I The hybrid system will become hot after starting as the system uses high voltage. Be careful of both the high voltage and the high temperature, and always obey the caution labels attached to the vehicle.



- I Never try to open the service plug access hole located in the luggage compartment. The service plug is used only when the vehicle is serviced and is subject to high voltage.
- I Do not subject the service plug to strong impacts. Also, avoid splashing large amount of water onto the luggage compartment, for example while in a high-pressure car wash.

n Hybrid battery (traction battery)

Your vehicle contains a sealed nickel-metal hydride battery. If disposed of improperly, it is hazardous to the environment and there is a risk of severe burns and electrical shock that may result in death or serious injury.

n Emergency shut off system

- I Carefully check to see if there are exposed high voltage parts or cables. Never touch the parts or cables. (→P. 32)
- I Carefully inspect the ground under the vehicle. If you find that liquid has leaked onto the ground, the fuel system may have been damaged. Leave the vehicle as soon as possible.

 **CAUTION****n Road accident cautions**

Observe the following precautions to reduce the risk of injury.

- I** Pull your vehicle off the road, push the “P” position switch, apply the parking brake and turn the hybrid system off.
- I** Do not touch the high voltage parts, cables and connectors.
- I** If electric wires are exposed inside or outside your vehicle, an electric shock may occur. Never touch exposed electric wires.
- I** If a fluid leak occurs, do not touch it as it may be strong alkaline electrolyte from the hybrid battery (traction battery). If it comes into contact with your skin or eyes, wash it off immediately with a large amount of water or if possible, boric acid solution. Seek immediate medical attention.
- I** If a fire occurs in the hybrid vehicle, leave the vehicle as soon as possible. Never use a fire extinguisher that is not meant for electric fires. Using even a small amount of water may be dangerous.
- I** If your vehicle needs to be towed, do so with the front wheels raised. If the wheels with the electric motor (traction motor) are on the ground when towing, the motor may continue to generate electricity. This may cause an electricity leakage leading to a fire. (→P. 479)

 NOTICE

n Hybrid battery air vent

- I** Do not put foreign objects over the air vent. The hybrid battery (traction battery) may overheat and be damaged.
- I** Clean the air vent regularly to prevent the hybrid battery (traction battery) from overheating.
- I** Do not wet the air vent. It may cause a short circuit and damage the hybrid battery (traction battery).
- I** Do not load a large amount of water such as an aquarium into the vehicle. If water spills over the hybrid battery (traction battery), the battery may be damaged.