

Hybrid Types

When it comes to the rapidly expanding hybrid market, gimmicks are rampant. Automakers and the popular media are calling a variety of different engine/motor configurations "*hybrids*", giving you the impression they are all the same. They don't provide a clear explanation of specific design or even a category, making the choices for consumers very confusing... as well as misleading.

The following is an attempt to provide standard identification types based on minimum requirements of the hybrids currently available...



Not Really a Hybrid

Type I (Low-Voltage / Low-Power) - a traditional system fitted with a 42-volt battery, but marketed as a "mild" hybrid.

Strictly following this definition of hybrid: "*Something of mixed origin or composition*" this type doesn't even qualify, since there is only a single source of propulsion power to the wheels. Realistically, a vehicle should not be called hybrid unless at a minimum it shuts off the engine after stopping, has regenerative braking, and has an electric-motor that contributes propulsion power.

- Shuts off the engine when the vehicle stops.
- Recaptures energy when the vehicle slows to charge the battery-pack.
- No propulsion power whatsoever is provided by an electric-motor.

ASSIST

Type II (High-Voltage / Low-Power) - a system with a small battery-pack (relative to energy stored & consumed) and a single small electric-motor that contributes propulsion power to the wheels while the vehicle is accelerating.

Passive - how the electrical system can be best described using a simplistic non-technical term.

- Shuts off the engine when the vehicle stops.
- Recaptures energy when the vehicle slows to charge the battery-pack.
- Provides some propulsion power with an electric-motor.

Additional information... http://john1701a.com/prius/hybrid-type_assist.htm

FULL

Type III (High-Voltage / High-Power) - a system with a large battery-pack (relative to energy stored & consumed), a small electric-motor, at least one large electric-motor, and an engine that combined provide a wide variety of combustion & electric propulsion abilities.

Persistent - how the electrical system can be best described using a simplistic non-technical term.

- Shuts off the engine when the vehicle stops.
- Recaptures energy when the vehicle slows to charge the battery-pack.
- Can propel the vehicle via a gas-engine and/or an electric-motors using all 3 methods: *Engine-Only*, *Motor-Only*, *Engine & Motor*.
- Electric-Motor can sometime use electricity provided directly from a gas-engine, rather than always having to draw it from the battery-pack.

Additional information... http://john1701a.com/prius/hybrid-type_full.htm

http://john1701a.com/prius/hybrid-type_full_details.htm

http://john1701a.com/prius/hybrid-type_full_operation.htm

Honda

Insight, Civic-Hybrid, Accord-Hybrid are hybrids from Honda which are the hybrid type: *Assist*

Only one electric-motor is used in this system. It can be used to both provide propulsion power assistance for the engine and to recharge the battery-pack, but not at the same time. The electric-motor is also used to startup the engine.

Saturn (GM)

Vue is a hybrid from Saturn (a division of GM) which is the hybrid type: *Assist*

Only one electric-motor is used in this system. It can be used to both provide propulsion power assistance for the engine and to recharge the battery-pack, but not at the same time. The electric-motor is also used to startup the engine.

Toyota / Lexus

Camry-Hybrid, Highlander-Hybrid, the "*Original*" (1998-2000), the "*Classic*" (2001-2003), and the "*HSD*" (2004-2006) model **Prius** are all hybrids from Toyota which are the hybrid type: *Full*

RX-400h, GS-450h are also hybrids available from Toyota, under their luxury brand Lexus. They are also the hybrid type: *Full*

At least two electric-motors are used in this system. One motor is used to create electricity. The other motor is used to provide propulsion power and to startup the engine. Both can be used at the same time, preventing the need to always draw from the battery-pack; this is beneficial for moderate acceleration and climbing hills.

Has the ability to drive up to 42 MPH using only electricity without the engine in motion; this is especially beneficial in stop & slow commute driving as well as on suburb streets.

Ford / Mercury

Escape-Hybrid, Mariner-Hybrid are available as hybrids from Ford which are the type: *Full*

Two motors are used in this system. One motor is used to create electricity. The other motor is used to provide propulsion power and to startup the engine. Both can be used at the same time, preventing the need to always draw from the battery-pack; this is beneficial for moderate acceleration and climbing hills.

Has the ability to drive up to 25 MPH using only electricity without the engine in motion; this is especially beneficial in stop & slow commute driving.