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AutoSmart

Learn the facts: Hybrid electric vehicles

What is the issue?

Hybrid vehicle technology is becoming increasingly prominent in passenger vehicles as automakers respond to progressively more stringent greenhouse gas regulations and consumer demand.

What do I need to know?

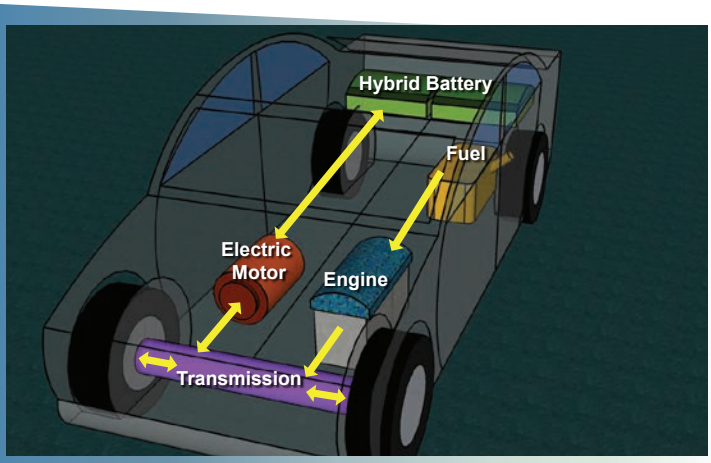
Hybrid electric vehicles (HEVs) – or hybrids – use both a conventional internal combustion engine and an electric motor to achieve greater overall fuel efficiency. HEVs use innovative strategies to improve vehicle efficiency such as:

1. capturing the energy otherwise lost during braking and storing it in the battery for future use
2. propelling the vehicle by using either the conventional internal combustion engine or the electric motor or both
3. turning off the conventional internal combustion engine when the vehicle is stopped
4. reducing the vehicle's weight and rolling resistance
5. improving aerodynamics
6. reducing the size of the conventional internal combustion engine

- Innovative strategies used in HEVs make them more energy-efficient than gasoline-only vehicles. The HEV uses regenerative braking technology to recover energy that otherwise would have been wasted as heat during braking. The HEV also turns off the internal combustion engine when it is not needed, instead using only the electrical system for operations such as deceleration and initial acceleration and for operating auxiliary components while the vehicle is stopped.

- An HEV combines a small conventional propulsion system with an electric propulsion system to maintain the performance of a conventional vehicle. The electric propulsion system also helps to reduce noise and vibration, providing a smoother driving experience.

- When operating in electric mode, the HEV emits no carbon dioxide (CO_2) or other emissions.



- Hybrid vehicle choices are growing. Automakers now offer a larger selection of hybrid vehicles, with over 30 models in Canada as of the 2014 model year. Although automakers use different approaches and varying degrees of hybridization, all HEVs have battery packs that are charged with electricity generated by the vehicle, either through regenerative braking or the internal combustion engine. HEV battery packs are not charged from the electric grid, therefore these hybrids have no plug-in charger.

How can I help?

- **Consider purchasing a hybrid vehicle if:**
  - You want to improve the fuel efficiency of your vehicle.
  - You want to lower the fuel costs of your vehicle.
  - You want to lower your CO_2 emissions.

- **Be a knowledgeable buyer!**
  When you purchase a vehicle, ask about existing and planned hybrid vehicle options. Ask for a cost, environmental and performance comparison and decide whether a hybrid makes sense for you.

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What are the savings and benefits?

Hybrid vehicles offer the greatest benefits over a longer period of time. The higher purchase price of a hybrid can be recouped through lower fuel costs. The following table provides comparisons between hybrid and non-hybrid models. In most cases, the hybrid vehicle offers fuel savings and CO_2 reductions of 20 to 40%. Actual savings depend on the specific vehicle and its operating conditions.

Fuel consumption comparison between hybrid and standard engine models

Make and model	Engine size (L, cylinders)	Fuel type	City consumption rating (L/100 km)	Highway consumption rating (L/100 km)	Annual fuel cost	Annual fuel consumption	Annual CO_2 emissions	Reduction in fuel consumption and CO_2 emissions
Acura ILX	2.0, 4	Premium	9.9	6.7	$2,465	1 700 L	3 910 kg	-
Acura ILX Hybrid	1.5, 4	Premium	6.0	5.8	$1,711	1 180 L	2 714 kg	31%
Buick Regal	2.0, 4	Premium	11.5	7.9	$2,871	1 980 L	4 554 kg	-
Buick Regal eAssist	2.4, 4	Regular	9.6	6.5	$2,132	1 640 L	3 772 kg	17%
Ford Fusion	2.0, 4	Regular	10.5	7.1	$2,340	1 800 L	4 140 kg	-
Ford Fusion Hybrid	2.0, 4	Regular	5.0	5.0	$1,300	1 000 L	2 300 kg	44%
Honda Accord	2.4, 4	Regular	9.0	6.6	$2,054	1 580 L	3 634 kg	-
Honda Accord Hybrid	2.0, 4	Regular	4.7	4.9	$1,248	960 L	2 208 kg	39%
Hyundai Sonata	2.4, 4	Regular	9.8	7.0	$2,210	1 700 L	3 910 kg	-
Hyundai Sonata Hybrid	2.4, 4	Regular	6.5	5.9	$1,612	1 240 L	2 852 kg	27%
Infiniti Q50	3.7, 6	Premium	12.0	8.0	$2,958	2 040 L	4 692 kg	-
Infiniti Q50 Hybrid	3.5, 6	Premium	8.2	6.7	$2175	1 500 L	3 450 kg	26%
Lincoln MKZ	2.0, 4	Regular	10.5	7.1	$2,340	1 800 L	4 140 kg	-
Lincoln MKZ Hybrid	2.0, 4	Regular	5.2	5.2	$1,352	1 040 L	2 392 kg	42%
Nissan Pathfinder 4WD	3.5, 6	Premium	12.3	9.3	$3,190	2 200 L	5 060 kg	-
Nissan Pathfinder Hybrid 4WD	2.5, 4	Regular	9.1	8.5	$2,288	1 760 L	4 048 kg	20%
Porsche Cayenne S	4.8, 8	Premium	15.0	10.6	$3,770	2 600 L	5 980 kg	-
Porsche Cayenne S Hybrid	3.0, 6	Premium	11.8	9.9	$3,161	2 180 L	5 014 kg	16%
Subaru XV Crosstrek AWD	2.0, 4	Regular	9.5	7.2	$2,210	1 700 L	3 910 kg	-
Subaru XV Crosstrek Hybrid AWD	2.0, 4	Regular	8.1	7.2	$2,002	1 540 L	3 542 kg	9%
Toyota Camry	2.5, 4	Regular	9.5	6.6	$2,132	1 640 L	3 772 kg	-
Toyota Camry Hybrid LE	2.5, 4	Regular	5.5	5.9	$1,482	1 140 L	2 622 kg	30%
Volkswagen Jetta	1.8, 4	Regular	9.5	6.7	$2,132	1 640 L	3 772 kg	-
Volkswagen Jetta Turbo Hybrid	1.4, 4	Premium	5.6	5.2	$1,566	1 080 L	2 484 kg	34%

Note: Model year 2014 vehicles. For illustrative purposes, annual figures are based on an annual driving distance of 20 000 km (55% city, 45% highway), fuel prices of $1.30/L for regular gasoline and $1.45/L for premium gasoline, and a CO_2 emissions factor of 2.3 kg/L of gasoline.

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