ICE, HEV, PHEV and BEV – What they mean and what’s under the hood

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With the growth of electric vehicles, hybrids and alternative fuels, there’s a much more diverse mix of fuel types on the roads, and as a result, a number of different engines under the hood. In this post, we’ll break down a few of the vehicle types you’ve likely seen or will be seeing on the road – and the sometimes confusing acronyms that are used to describe them.

ICE – Internal Combustion Engines

Your traditional engines, powered by gasoline, diesel, biofuels or even natural gas. These make up the bulk of the vehicles on the road, and we’re likely all very familiar with them. While today’s ICEs are significantly more efficient and have lower emissions than those from decades ago, the fundamental technology – burning fuel to create power – remains the same.

HEV – Hybrid electric vehicles

The most common of the alternative fuel vehicles we see on the road these days – the Toyota Prius is the most obvious example – are powered by a combination of an ICE and an electric motor (hybrid vehicle drivetrain). While the exact function of an HEV’s drivetrain may vary, fundamentally they all share the same characteristics of having a hybrid vehicle drivetrain and an electric battery, where either or both the ICE and electric motor power the drivetrain. The batteries can be charged in a few ways, either by spinning an electric generator when the ICE is operating or in some cases, by converting the vehicle’s kinetic energy into electric energy through systems like regenerative brakes.

PHEV – Plug-in hybrid electric vehicles

These engines are in many ways very similar to the HEV in that they have a hybrid vehicle drivetrain and use both an ICE and electric power. The big difference with these vehicles is that their rechargeable battery can be charged by plugging in to a power source. When the battery is depleted, the plug-in hybrid starts acting as a regular hybrid, with the combustion engine taking the role of primary power source. The most common example of this vehicle type is the Chevrolet Volt.

To learn more, check out this article from autoevolution on the difference between hybrid and plug-in hybrid vehicles.

BEV – Battery electric vehicles

Unlike the other three vehicle types on this list, the BEV has no internal combustion engine or fuel tank at all and runs on a fully electric drivetrain powered by rechargeable batteries. These vehicles need to be plugged in to a power source to charge, and depending on the vehicle, they have varying charging times and driving ranges. The most common two examples of these vehicles are the Nissan Leaf or Tesla Model S.

Now that you understand the lingo, check out these earlier posts to find out where these vehicles fit in Canada’s transportation landscape:

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Why battery-powered vehicles are not taking the market by storm
Top 3 reasons to buy a gas-powered car: innovation, value and fuel efficiency
Are electric vehicles the best way to reduce GHGs?
Plugging into the future of electric vehicles
Is natural gas the next transportation fuel? The pros and cons
Today's cars can't run on biofuels alone