

How Hybrid Cars Work

Have you pulled your car up to the gas pump lately and been shocked by the high price of gasoline? As the pump clicked past \$20, \$30, \$40 or even \$50, maybe you thought about trading in your car for something that gets better mileage. Or maybe you're worried that your car is contributing to the greenhouse effect.



The auto industry has the technology to address these concerns. It's the hybrid car. There are a lot of models on the market these days, and most automobile manufacturers have announced plans to manufacture their own versions.

How does a hybrid automobile work? What goes on under the hood to give you 20 or 30 more miles per gallon than the standard automobile? And does it pollute less just because it gets better gas mileage? In this article, we'll help you understand how this technology works, and we'll even give you some tips on how to drive a hybrid car for maximum efficiency.

Many people have probably owned a hybrid vehicle at some point. For example, a mo-ped (a motorized pedal bike) is a type of hybrid because it combines the power of a gasoline engine with the pedal power of its rider. In fact, hybrid vehicles are all around us. Most of the locomotives we see pulling trains are diesel-electric hybrids. Cities like Seattle have diesel-electric buses -- these can draw electric power from overhead wires or run on diesel when they are away from the wires. Giant mining trucks are often diesel-electric hybrids. Submarines are also hybrid vehicles -- some are nuclear-electric and some are diesel-electric. Any vehicle that combines two or more sources of power that can directly or indirectly provide propulsion power is a hybrid.

Most hybrid cars on the road right now are

gasoline-electric hybrids, although French car maker PSA Peugeot Citroen has two diesel-electric hybrid cars in the works. Since gasoline hybrids are the kind you'll find at your local car dealership, we'll focus on those in this article.

The gasoline-electric hybrid car is just what it sounds like a cross between a gasoline-powered car and an electric car. Let's start with a few diagrams to explain the differences between a gasoline-powered car and a typical electric car.

A gas-powered car has a fuel tank, which supplies gasoline to the engine. The engine then turns a transmission, which turns the wheels.

An electric car, on the other hand, has a set of batteries that provides electricity to an electric motor. The motor turns a transmission, and the transmission turns the wheels.

The hybrid is a compromise. It attempts to significantly increase the mileage and reduce the emissions of a gas-powered car while overcoming the shortcomings of an electric car.

To be useful to you or me, a car must meet certain minimum requirements. The car should be able to:

- Drive at least 300 miles (482 km) between re-fueling
- Be refueled quickly and easily
- Keep up with the other traffic on the road

A gasoline car meets these requirements but produces a relatively large amount of pollution and generally gets poor gas mileage. An electric car, however, produces almost no pollution, but it can only go 50 to 100 miles (80 to 161 km) between charges. And the problem has been that the electric car is very slow and inconvenient to recharge.

A gasoline-electric car combines these two setups into one system that leverages both gas power and electric power.

混合動力車運作方式

您最近曾爲了愛車調高的汽油高價所震驚嗎？隨著汽油價格起跳從\$20、\$30、\$40 或甚至高達\$50，或許您已經考慮改裝某些東西讓愛車(每公升汽油)行進哩程數增加(油耗更有效率)；也或許您正憂慮愛車(廢氣排放)加速了全球溫室效應的惡化。



而汽車工業的科技對這些相關課題有所指示，它就是(Hybrid)混合動力車。最近有許多車款上市，而大部分車廠已宣稱有計劃生產自有型式的車款。

一輛混合動力車要如何運作？在引擎蓋下方究竟發生什麼而讓您比一般車輛每加侖多跑 20 或 30 英哩？它的低污染只是因爲其更佳的油耗/英哩數嗎？在這篇文章裡，我們將會協助您了解這項科技的運作方式，甚至將給您一些小訣竅-如何駕駛混合動力車以獲得最大效率。

許多人可能基於某些論點而擁有一輛混合動力交通工具。舉例而言，一輛 mo-ped(摩托自行車)就是混合動力的一種形式，它結合汽油引擎與騎士腳踏板動力。事實上，混合動力交通工具就圍繞在我們四周。我們所見大部分推動火車的火車頭都是柴油-電力的混合。像西雅圖一般的大城市有柴油-電力混合的巴士-這些巴士可以靠車頂的纜線獲取電力以拉動車身，或遠離纜線時靠柴油動力行進。巨型採礦卡車常常是柴油-電力混合。潛艇也是混合動力交通工具-某些是核能-電力混合、某些則是柴油-電力混合。任何結合兩種或兩種以上動力來源，可以直接或間接提供推動力的交通工具就是混合動力。

雖然法國 PSA 集團 Peugeot Citroen(標緻-雪鐵龍)汽車製造廠的產品中有兩種柴油-電力混合動力車款，但目前大部分在路上行駛的混合動力車爲汽油-電力混合。既然您將會在所在地區的汽車代理經銷商發現該汽油混合動力的車款，這篇文章我們就聚焦在它們身上。

汽油-電力混合動力車就如同字面上聽起來一樣-橫跨汽油動力車與電動車之間的车種，讓我們開始以些許圖表解釋汽油動力車與典型電動車之間的不同。

汽油動力車具備油箱，以提供引擎汽油。引擎轉動傳動軸(傳動系統)藉以轉動車輪。

另一方面，電動車具備一個電池裝置，以提供電動馬達電力。這個電動馬達轉動傳動軸藉以轉動車輪。

混合動力是折衷方案。它試著有效地增加哩程而且減少汽油動力車排放量，同時克服電動車的缺點。

爲了您的實用性，一輛車必須確定符合某些最小的必要條件，該車應該可以：

- 兩次補充燃料之間至少行駛 300 英哩(482 公里)。
- 快速簡單地補充燃料。
- 可以跟上其他路上交通工具。

汽油動力車符合這些必要條件，但相對產生大量的汙染而且一般汽油哩程較短(耗油不經濟)。然而，電動車幾乎不會產生汙染，但它在兩次充電之間只能行駛 50 到 100 英哩(80 到 161 公里)，而且電動車已存在速度非常慢與充電不方便等問題。

油電混合動力車結合這兩種裝置在一個系統，如此對汽油動力與電力做一平衡。