



Plug-in Hybrids (PHEV) – MPGe Fuel Economy Rating

MODEL

I12 (i8)	F15 PHEV (X5 xDrive 40e)	F30 PHEV (330e Sedan)
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SITUATION

Customers may question the accuracy of the MPGe fuel economy rating from the Monroney Label sticker, when comparing it with an average every-day driving fuel economy MPG values displayed via On-Board-Computer.

INFORMATION

The MPGe (“Miles Per Gallon equivalent”) is a measure designed by the EPA to help customers compare electrical energy consumption used by PHEV (or BEV) vehicles, to fuel consumption of conventional combustion engine vehicles.

It represents a number of miles a PHEV vehicle can travel using a quantity of electric energy with the same energy content as one gallon of gasoline. The ratings are based on EPA’s formula, in which 33.7 kWh of electric energy is equal to one gallon of gasoline, and the vehicle’s energy consumption is calculated during EPA’s five standard drive test cycles simulating varying driving conditions.

The five EPA driving tests (SFTP) consist of the: city test, highway test, cold temperature test, air condition test, and high speed/acceleration test. Driving is performed in a controlled laboratory environment on the dynamometer, and the results are combined to estimate a city and highway fuel consumption rates.

Plug-In Hybrid vehicles, which combine characteristics of an all-electric car and a conventional hybrid (e.g. F04, ActiveHybrid 7), have a more complex fuel economy label to address their dual mode status.

The PHEV Monroney label provides fuel economy estimates for the two operating modes separately; the fuel economy in electric mode in terms of MPGe, and fuel economy in gasoline consumption mode in terms of the traditional city-highway-combined MPG. Per regulation, the label does NOT display an estimate for composite electric/gasoline mode, as customer’s driving habits may vary. Instead it shows a total combined all-electric and gasoline range.

	F15 PHEV (X5 xDrive 40e): Calculation of 56 MPGe applies for the 14 miles of mainly electric drive, and combines electric energy from the High Voltage battery (6.7 kWh, equivalent of 0.1988 gallon of gasoline) with some small quantity (below 0.1 gallon) of consumed gasoline. The combined city/highway 24 MPG fuel economy applies to the remaining 526 miles of combustion
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engine operation (with an occasional electric motor boosts during accelerations).

The total calculated range (with both electric and conventional gasoline engine operations) is shown as **540 miles**.



F30 PHEV (330e):

Calculation of **72 MPGe applies for the 14 miles** of mainly electric drive, and combines electric energy from the High Voltage battery (5.8 kWh, equivalent of 0.1721 gallon of gasoline) with some small quantity (below 0.1 gallon) of consumed gasoline.

The combined city/highway **31 MPG** fuel economy applies to the remaining 336 miles of combustion engine operation (with an occasional electric motor boosts during accelerations).

The total calculated range (with both electric and conventional gasoline engine operations) is shown as **350 miles**.



I12 (i8)

Calculation of **76 MPGe applies for the 15 miles** of mainly electric drive, and combines electric energy from the High Voltage battery (5.1 kWh, equivalent of 0.1513 gallon of gasoline) with some small quantity (below 0.1 gallon) of consumed gasoline.

The combined city/highway **28 MPG** fuel economy applies to the remaining 315 miles of combustion engine operation (with an occasional electric motor boosts during accelerations).

The total calculated range (with both electric and conventional gasoline engine operations) is shown as **330 miles**.

In conclusion, the MPGe rating provides a measure to compare fuel economy of a vehicle with two operating propulsion modes – one using electricity as the energy source, and the other using gasoline. It is a virtual calculation derived from simulated driving conditions. Real world fuel/electricity consumption can vary greatly depending on outside factors, like: weather, traffic situation, tire pressure, temperature, driving style, fuel quality, road surface condition, vehicle load, etc., etc.,.

EPA fuel consumption ratings (MPGe/MPG) are meant to provide a comparison, and they are not a guaranty or promise of actual performance during daily vehicle usage.

**NOTE:**

The MPGe consumption value is not calculated/displayed when using vehicle's On-Board Computer Trip function.

The “**Electrical consumption**” expressed in **ml/kWh** (miles per kilowatt hour), indicates average driven distance per unit of consumed electric energy (1 kWh), during a trip with mixed hybrid operation (combustion gas engine and electric motor). Driving mostly in an electric mode will cause this value to decrease (to around 2 ml/kWh). Driving mostly in the combustion engine mode will have it increase (electric energy used mainly for acceleration boost, and not for all-electric driving, will result in distributing a full HV battery charge for a longer driving distance).

Since this calculation includes all propulsion scenarios (all-electric, gas engine only, and mixed operation - combustion engine supplemented by electric motor), there is no conversion to the MPGe rating.

WARRANTY INFORMATION

Not applicable.

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