

**October 2014**

## **Hybrid technology king of the urban jungle**

The advantage of hybrid vehicles over frugal diesels can often be an illusion, if the judging criteria is solely based on fuel economy, warns Emissions Analytics - the leading provider of real-world emissions measurement.

Having tested over 30 hybrids in the UK and US, Emissions Analytics has analysed thousands of data points to understand how they really perform in the real world, and compared them to conventional ICE only vehicles.

The data set compares two standard hybrids versus eight diesels, evaluated as part from the real-world fuel economy testing Emissions Analytics conducts with What Car? in the UK. Each model used an engine ranging from 1.5 to 2.2-litres, generating up to 150bhp, employed two-wheel drive, with a hatchback, saloon or estate body style.

The results (fig. 1) show that while hybrids can deliver good fuel economy in real world driving, they can be eclipsed by up to 10mpg by some non-hybrid diesels. This is after having taken into account any net changes in battery charge levels - to ensure that the hybrids are not penalised over the test cycle.

For certain driving patterns, however, hybrids still prove the better option. Using Emissions Analytics' complete dataset of more than 500 vehicles in the UK, it can quantify how average MPG can fluctuate when dealing with congestion and aggressive or fast driving.

The data (fig. 2) shows that hybrids suffer much less than their ICE equivalents in congested urban driving: on average a 3% penalty compared to 7%. In contrast, by doubling the average rate of acceleration, the MPG falls by more for hybrids - especially diesel hybrids.

Comparing motorway driving to town driving, all types of vehicle show better MPG on faster routes. However, the difference between hybrids and ICE vehicles is dramatic – typically because the downsized engines found in the hybrids are less suited to motorway cruising.

Lower urban fuel consumption is not the only attraction of hybrid cars, as many people are motivated by their green credentials – and hybrids can deliver a significant emissions reduction in urban areas. “For diesel cars, we have previously found that low speed, stop-start driving dramatically increases levels of NOx emissions,” says Nick Molden, CEO of Emissions Analytics. A recent report by the International Council on Clean Transportation, which analysed data from Emissions Analytics, showed that the latest Euro 6 diesel cars can exceed the NOx targets by an average of seven-fold.

This contrasts with petrol-only vehicles, which generally meet the regulated NOx standards - even in real-world driving. Carbon monoxide emissions are generally higher for petrol-only vehicles, but still within the regulated values. As a result, petrol hybrids have the benefit over ICE diesels in their

effect on air quality, enhanced by the fact that a proportion of urban driving will be on battery - with zero emissions.

Given the current debate about diesel car emissions in towns and cities, Emissions Analytics' research confirms that hybrids, particularly petrol ones, could help to reduce many of the pollutants emitted in these conditions – most importantly NOx.

“Hybrids may deliver good but not best-in-class fuel economy, but they are typically the cleanest, and if you are a light-footed, congested-town driver, they are ideal,” explains Nick Molden.

fig. 1 – Hybrids versus diesels, ranked by fuel economy:

Make	Model	Engine Size	Derivative	Fuel	Transmission	True MPG
Honda	Civic	1.6	i-DTEC ES	Diesel	Manual	67.2
Skoda	Octavia	1.6	Greenline III TDi CR	Diesel	Manual	61.9
Peugeot	308	1.6	Allure BlueHDi	Diesel	Manual	60.8
Mazda	3	2.2	SE-L Nav Skyactiv-D	Diesel	Manual	59.4
Toyota	Auris	1.8	Touring Sports Icon VVT-I	Petrol hybrid	Automatic	58.7
Citroen	C4 Cactus	1.6	Flair e-HDi	Diesel	Automatic	57.8
Toyota	Yaris	1.5	Excel VVT-I	Petrol hybrid	Automatic	57.8
Peugeot	2008	1.5	Feline e-HDi	Diesel	Manual	57.7
Volkswagen	Golf	1.6	Bluemotion TDi	Diesel	Manual	56.8
Honda	CR-V	1.6	i-DTEC SR	Diesel	Manual	56.5

fig. 2 – The effect of congestion and aggressive or fast driving on fuel economy

	Urban congestion penalty	Urban aggression penalty	Extra urban benefit
Diesel	-6.0%	-8.4%	18.4%
Diesel hybrid	-2.5%	-12.9%	1.1%
Petrol	-8.3%	-6.5%	27.4%
Petrol hybrid	-3.3%	-7.5%	8.5%

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### Notes to Editors

Emissions Analytics provides on-road vehicle emissions measurement and analysis. Its bespoke services include benchmark tests, product evaluation and real-world running costs. It measures with precision all regulated pollutants, including CO, CO<sub>2</sub>, NO, NO<sub>2</sub>, total hydrocarbons and particulate matter.

Emissions Analytics' pioneering role as supplier to What Car's break-through True MPG scheme has seen it test over 400 models and makes of passenger cars, providing consumers with an easy and reliable way to assess real-world fuel economy.



As experts in vehicle emissions and fuel consumption, Emissions Analytics supports a range of commercial and publicly-funded organisations. It is currently in partnership with Imperial College, London, studying urban emissions for transport planning and policy.

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