

## Peugeot 308 e-HDi

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Kim Henson appraises Peugeot's popular family hatchback, in super-frugal e-HDi form.



It's laudable, of course, to build a family-friendly car that, on paper at least, also does its bit both for the environment and running costs, in terms of low emissions and excellent fuel economy respectively. However, two pertinent questions arise. First, how well do the various technologies incorporated into the vehicle work together in optimising emissions and mpg figures in real-world motoring? Second, if it is accepted that the car really is an



'ultra economy' model in its fuel consumption, as well as being especially environmentally-friendly, do these aspects preclude it from being enjoyable to drive?

To find out if the Peugeot 308 e-HDi fulfils all its aims, I lived with an example for a week, during which time it was subjected to local commuting and shopping runs, gentle cruising and a 500 mile round trip with the vehicle fully laden with passengers and luggage.



Side view shows styling lines flowing from nose to tail.



The rounded rear end conceals a large luggage compartment. Note the wide doors – aiding entry and exit.



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Particularly attractive (and effective) front lamp units identify the current 308 models.



The HDi engine pulls well, and delivers excellent fuel economy. The built-in stop and start technology reduces in-town fuel consumption and emissions. (Photo courtesy Peugeot).



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The driving compartment is comfortable and attractive.



Instrumentation is smart and easy to assimilate.





A standard feature on the 'Allure' variant is this Cielo panoramic glass roof, complete with electrically-operated blind. Lovely!



The luggage compartment is long, wide and usefully deep.

## HISTORY

Before examining how the Peugeot acquitted itself during my time with the car, it is worth setting the scene by looking briefly at the history of the 308 in its various forms.

The model was introduced in September 2007, and offered in five door hatchback form, also in 'SW' estate guise (from June 2008), or as a 'Coupé Cabriolet' or 'CC', from June 2009.

Revisions to the model in May 2011 (UK models) brought styling updates, notably including new, bolder profiles for the grille, bonnet and front lights, with corresponding changes also being made to the side and rear bodywork. The overall effect was to make the 308 look lower, wider, sleeker and more 'fluid'.

Even more important were under-the-skin changes, incorporating up to the minute re-engineering, with the aim of improving both fuel consumption and CO2 emissions - now starting from just 98 g/km. For owners in Britain the sub-100 g/km CO2 figure is vitally



important in the running cost stakes, as it means that any cars in this category qualify for zero rate Road Tax.

Like its predecessors, the current 'New 308' is available in hatchback, SW and CC forms, and a range of power units is offered; four petrol engines (with outputs ranging from 98 to 200 bhp), and four HDi diesels (92 bhp to 163 bhp).

Across the range, measures have been taken to optimise efficiency, including weight reduction (25kg per vehicle, on average), the application of the latest thinking in engine technology, and the use of tyres with a very low rolling resistance.

For the e-HDi version under review, 'Micro-Hybrid' stop and start technology has also been built in (more of this anon), and this model's drag co-efficient of 0.28 represents a 'best in market segment' figure.

## e-HDi - THE TECHNOLOGY

The e-HDi version is based on the same platform/body shell as the other 308 hatchback models in the line-up, and the running gear set-up is also shared. So it features a transversely-mounted engine driving the front wheels, and the power is delivered through a six speed manual gearbox (as on our test car) or alternatively an electronically-controlled six speed manual transmission ('EGC') can be specified.

Suspension is by MacPherson struts at the front, with torsion beams at the rear. Braking is by discs on all four wheels, and electro-hydraulic variable-rate power-assisted steering is employed.

Among an array of built-in safety features, modern technology aids include anti-lock brakes with electronic brake force distribution ('EBFD'), emergency brake assist ('EBA'), automatic operation of the hazard lamps under heavy braking, also Bosch electronic stability program ('ESP') and traction control ('ASR') systems.



Of particular interest, especially in the context of saving CO2 emissions and fuel, is Peugeot's e-HDi Micro-Hybrid second generation stop and start system.

At the heart of this is a 112 bhp, 1.6 litre common rail type HDi ('High pressure Direct injection') FAP (particle filter) Euro 5 compliant four cylinder diesel engine.

To start with, a significant advantage of the HDi units, compared with traditional, indirect injection diesel motors, is a 20 per cent reduction in CO2 emissions (as well as drops of 40 per cent in terms of carbon monoxide produced, 50 per cent in hydrocarbons and 60 per cent in particles). The particle filter is there to deal with polluting soot particles ('black smoke').

By contrast with the standard engine on which it is based, the modified unit in the e-HDi differs in terms of the turbocharger lubrication system, the diesel injection pump, the crankshaft bearings, the inlet system (sealed) and in having a dual mass flywheel.

Fitted in conjunction with this engine is a reversible alternator/starter assembly to provide an automatic 'stop and start' function. This cuts the engine (for example when the vehicle is at a standstill at junctions, etc.) to save fuel and emissions, and is designed to operate silently and virtually imperceptibly. In fact the system shuts down the engine from 12 mph in versions equipped with the manual gearbox, and from 5 mph in those with the electronically-controlled transmission (EGC).

Integral to Peugeot's innovative set-up are an alternator voltage control system, which recovers energy (that would otherwise be wasted) during deceleration, and a hybrid battery for storing and delivering extra energy on start-up ('e-boosters').

The net results are claimed to be a 15 per cent reduction of fuel consumption in urban driving, plus a drop of five g/km in CO2 emissions for 'approved cycle' fuel consumption. In addition, it is said that this system re-starts the engine twice as rapidly as a normal manual 'key' re-start, and 40 per cent faster than with an uprated starter motor stop/start system. For the record, it is claimed that the engine re-starts in just 400 milliseconds (although I



haven't timed this myself...).

If desired, the driver can switch off the system altogether, by means of a dash-mounted switch. Further built-in safeguards include the ability of the driver to change his or her mind (so that, during the process of stopping, the engine can be re-started immediately), and the automatic continuing operation of engine-driven assistance and comfort systems, even when the engine is shut off.

Interestingly, nearly 500 Peugeot Citroën engineers and technicians spent three years developing this e-HDi system, which during 2012 is expected to be fitted to 30 per cent of the group's HDi power units. The stated objective is to sell a million e-HDi vehicles by 2013.

## FEATURE PACKED

Like all other hatchback versions of the 308, the e-HDI has a wide, spacious five door body shell, and standard equipment levels are comprehensive, even in the more 'basic' versions.

Buyers of the e-HDI can choose between the trim levels used for the 'mainstream' 308 models (except the GT), including 'SR' (fleet-specific), 'Access', 'Active', 'Oxygo' and high-specification 'Allure', as tested.

Standard features with the 'Allure' trim level include (in addition to a wealth of other comfort and convenience equipment) such niceties as 'half-leather' upholstery, dual-zone climate control, electrically-operated, folding door mirrors, a reverse parking aid system, a Thatcham Category 1 ultrasonic alarm system, 'Peugeot Connect' USB with Bluetooth, 18 inch 'Nimbus' sports road wheels and a 'Cielo' panoramic glass roof. The roof itself does not open, but the glass roof assembly, running along most of the length of the car's roof, incorporates an electrically-controlled blind that can be set to allow as much light into the interior as required. When the blind is fully open, the majority of the area of the car's roof is open to daylight, giving an unusually bright and airy feeling to the interior.



## ON THE ROAD

When settling behind the wheel of any car developed with 'economy' in mind as a main goal, I always have a concern (due to experiences with a number of such vehicles) that while the vehicle may be frugal, it may also be dull in terms of driving pleasure – or at the very least it could lack sparkle. However, with this 308 I needn't have worried. With a useful 112 bhp on tap, the torquey turbocharged diesel engine pulled willingly, even from low speeds. In fact I found it to be lively in normal use. I appreciate that it's not a sports car (308 buyers seeking more rapid acceleration would in any case opt for a higher-powered variant), but it acquits itself well in the cut and thrust of 21st Century motoring.

Around town the e-HDi proved to be easy to drive, with a slick gearchange, and nicely weighted power-assisted steering (which still imparts plenty of 'feel' to the driver). The reverse parking system was also a great help in tight situations. By contrast, on occasions I found that the wide body, while very welcome for passenger comfort, could result in a little difficulty in parking areas with relatively narrow bays – including typical supermarket and hotel car parks, also most motorway service areas. The difficulty is that there is often insufficient width available within the marked bays, to open the doors wide enough to get in/out. This can especially be a problem if carrying less agile passengers.

I am anxious not to over-state this issue, because in addition to providing better than normal internal width at hip and shoulder level, the wide stance of the 308 aids stability – indeed, due to its positive, predictable handling on bends, the car is a joy to drive on twisting country by-ways.

I – and passengers I carried – found that the ride quality was generally very good, except at low speeds when it was a little 'joggly'/uncomfortable when driving over road surface imperfections.

On long trips, the car will cruise happily at motorway speeds with the engine running quietly and in an unstressed manner at low rpm. At 70 mph in top (sixth) gear in the test car, the rev counter needle was indicating just 1,900 rpm. This is good for fuel consumption



and, ultimately, engine life.

The cruise control was straightforward to operate, and once engaged, enabled a steady speed to be maintained for mile after mile, where road conditions allowed. Unlike many high-g geared 'economy' models, even with four adults and a boot full of luggage, the Peugeot willingly tackled uphill motorway gradients without the need for changing down a gear.

I liked the easy to assimilate dash layout, and in truth can find little to criticise in terms of the layout and operation of the controls. Just one curious aspect I noticed... It is only possible to reach the bonnet release handle with the left hand front door open, as the handle is located on the pillar. This apparently trivial fact could conceivably become a serious issue if the car is ever parked close against a wall, and you need to open the bonnet...

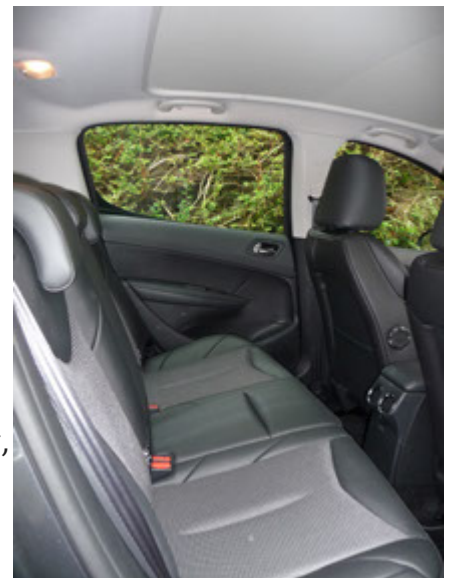
## COMFORT AND SPACE?

Given sufficient space around the vehicle, both the front and rear doors opened wide, to allow easy entry to, and exit from, the vehicle. The 'puddle' lamps illuminating the areas beneath the doors were welcome too.

The front and rear seats proved to be very comfortable over short and long trips. Travellers liked the fabric/leather upholstery, and especially the Cielo panoramic glass roof.

I found that head room and interior width was impressive throughout the passenger compartment. Leg room was excellent for front seat occupants, adequate in the rear.

Even with all seats occupied, the luggage compartment is long, wide and fairly deep, although the load sill is quite high from the ground. There is sufficient space for weekend luggage for four adults to be accommodated with ease.



Leg room for rear seat occupants is adequate.



When required, the rear seats (which incorporate three head restraints) split/fold on a 2/3:1/3 basis, giving a wide variety of seating versus luggage carrying options. In addition, a 'ski' hatch in the seat back enables long, fairly narrow items to be carried when required.

Head room is excellent.

Small but useful aspects I especially liked here were a small additional compartment on the right hand side of the boot, to accommodate a camera, flask, etc, plus a tall, lidded compartment on the opposite side, as well as an elasticated strap on the left hand 'wall' of the boot.

I always prefer a full-sized spare wheel (as opposed to the 'get you home' types or 'mobility' refill systems found on some cars), so full marks to Peugeot for taking this route. In this case the 'normal' spare wheel, together with the wheelchange tools, is housed in a separate compartment beneath a 'false' boot floor.

## STOP AND START?

I have deliberately left until last my impressions of the Micro-Hybrid stop and start system. This is a crucially important aspect of this Peugeot, so how well did it work? "Quite impeccably", is the answer.

On approaching a stop, the system quietly shuts down the engine, which remains 'off' (thus saving fuel and emissions) until the accelerator pedal is touched. At that point, as if by magic, the engine re-starts instantly, and so unobtrusively that truly it is difficult to feel or hear the engine re-start. In fact I have to say that this is one of the very best such systems I have experienced.

By contrast, on some cars costing far more than the 308, and fitted with 'stop-start' systems, the process of stopping and starting the engine is much more unrefined, obtrusive and noisy.



It's true that some people are a little nervous about driving a car with a stop and start system, and it usually takes a few miles to get used to the way in which it operates. Yet in town running it brings about 'perfect peace' when stopped waiting at traffic lights (etc.) and of course saves fuel and CO2 emissions too, so has to be a good thing.

It remains to be seen how long the operating life of the system will prove to be when in constant use, but Peugeot claims that the combined alternator/starter motor unit has a designed durability rating of 600,000 restarts...

Finally... the fuel economy. Peugeot figures suggest a 'Combined' consumption figure of over 67 mpg. Personally I feel that this would be difficult to achieve in normal driving, except in 'ideal' conditions. In a mixture of real life motoring, including urban, country and fast long-distance driving, the test car achieved a still very creditable overall figure of around 57 mpg, over a total of nearly 700 miles.

## VERDICT

In the 308 HDi, Peugeot has produced a likeable family hatchback that produces low levels of emissions and is genuinely economical (in mpg and road tax), yet it's also fun to drive. It's effective, economical, comfortable and enjoyable.

## WHEELS-ALIVE TECH. SPEC. IN BRIEF

### Peugeot 308 e-HDi

Engine: 1560cc HDi - four cylinder, direct injection, common rail, turbocharged diesel, with particulate filter and incorporating Micro-Hybrid (second generation) stop and start technology

Power: 112 bhp @ 3,600 rpm

Torque: 270 Nm @ 1,750 rpm

0-62 mph: 12.5 sec

Top speed: 118 mph



Fuel consumption:

('Urban'): 67.3 mpg

('Extra Urban'): 80.7 mpg

('Combined'): 74.3 mpg

CO2 emissions: 98 g/km

## **'ON THE ROAD' PRICE**

308 e-HDi prices start at £17,765 ('Access') and run to £19,665 ('Allure').

Note: The current 308 hatchback line-up starts at £15,345 and rises to £21,745 (GT THP).