

## Re: Experience driving with E85

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- *From:* Uncle Ben <[ben@xxxxxxxxxxx](mailto:ben@xxxxxxxxxxx)>
  - *Date:* Thu, 12 Jun 2008 11:39:12 -0700 (PDT)
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On Jun 12, 2:27 pm, Lloyd <[lpar...@xxxxxxxxxxx](mailto:lpar...@xxxxxxxxxxx)> wrote:

On Jun 12, 2:16 pm, Uncle Ben <[b...@xxxxxxxxxxx](mailto:b...@xxxxxxxxxxx)> wrote:

Looking at the history of sci.chem I see that the major debate here about ethanol as a fuel is around two years old. There was a lot of misinformation then, some of which can now be refuted by experimentation by an individual -- not a lab.

I have access to four E85 fuel stations (gas stations that sell E85 also) in Albany, NY. I took the risk of mixing E85 with E10 in my 1999 Subaru Outback, well beyond the age at which the warranty matters. I found that if I mixed half and half, my check-engine light came on after a few days. The code was "fuel trim", as one would expect, since the ECU in my car had hit the limit trying to increase the richness of the mixture required for stoichiometric burning.

I diluted the mix in the tank to 30% ethanol and the light went off in only 7 miles of driving. I found that my car had better performance. I could feel the acceleration in this old heap, unlike before. (No, my fuel pump did not crumble into bits. Misinformation point 1)

That was encouraging. So I bought a converter, inspired by a Brazilian invention, that stretches the electrical pulse to the fuel injectors and quickly installed it. And I filled up with straight E85. That was a month ago.

So here is how it has worked out. (This is personal experience, which

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happens to agree with others one can find on the internet, and which trumps the calculations of the armchair observers.)

It was written in this newsgroup that ethanol is much less efficient than gasoline. It is true that the energy density of ethanol is about 30% less than that of gasoline. My 16-gallon tank can't take me quite as far with E85 than with gasoline. I can live with that.

But the MPG penalty between E85 and gasoline is only 15%, not 30%, in my experience. Some physicist is going to write me that this violates the conservation of energy. But as a physicist myself, I am familiar with the concept that  $(\text{Energy Out}) = (\text{Energy In}) \times (\text{Efficiency})$ , which defines the kind of efficiency I am talking about now.

The chemical energy of ethanol is Energy In to an automobile. But what counts in life is Energy Out. Ethanol burns more efficiently in an internal combustion engine than gasoline.

Not so. IF you modify an engine with the higher compression ratio EtOH can use, it might be true, but putting EtOH in any blend in a gasoline-tuned engine will not burn any more efficiently.

From the MPG numbers, I have to conclude that the efficiency (in the current sense) of E85 is twice as high as that of gasoline.

Considering the tiny amount of unburned hydrocarbons from any modern automobile, they all burn gasoline so efficiently your premise is simply not possible.

It is the common experience of many E85 users that the MPG penalty is 5 – 15%. It is not just my experience. It is not that difficult to measure MPG.

Hence the much smaller MPG penalty. (It is explained in terms of ignition timing and burning rate.)

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I suggest you read what real, instrumented tests show.

But what concerns me more than MPG is MPD, or miles per dollar. E85 today costs \$3.05 per gallon; Gasoline (regular) is \$4.20. I am getting about 7 miles per dollar, versus only 6 with gasoline.

Generally, it's said buy E85 only if it's 25% below gas, as it gives 25% less energy.

My conclusion, subject to change as we careen toward the disaster ahead of us in Peak Oil, is that E85 is a much better fuel than regular gasoline. (It's even better compared to premium. The octane rating of E85 is 105, compared to 95 for super-premium IIRC.)

But again, NO engine sold is designed to take advantage of that. You'd need a higher compression ratio.

The emissions of E85 are much cleaner too. (Google it yourself.)

But they both put out the same mass of CO<sub>2</sub> per joule of energy produced. And EtOH produces acetaldehyde.

But gasoline puts out more energy than E85. What energy is not used appears in the form of heat.

The acetaldehyde is quite small. The CO<sub>2</sub> is half. The NO<sub>x</sub> is somewhat less (EtOH burns cooler.)

So E85 is cheaper, cleaner, hotter, and not imported. I am a happy driver.

Uncle Ben

<http://www.consumerreports.org/cro/cars/new-cars/news/2006/ethanol-10...>

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So, you want me to believe someone else's testimony rather than my own lying eyes, as Groucho said.

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