

Re: Gasoline grade BTUs per gallon?

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On 6 May 2006 17:15:40 -0700, "BobG" <bobgardner@xxxxxxx> wrote:

BW:

Higher grade gasoline has about the same energy content, it just allows a bit more efficiency from the engine.

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Can you quantify this somehow? To me efficiency is power out/power in. If the power in is the same, how does it increase the power out?

Engine efficiency is a function of compression ratio (peak temperature). Advancing the spark to ignite the fuel earlier before top dead center raises the effective compression ratio, but is limited by octane rating.

Lower octane fuel "pings" or detonates instead of burning smoothly. The engine control unit detects the pinging and retards the spark, preventing detonation, slightly reducing the effective compression ratio and efficiency, but greatly prolonging engine life.

When you use higher octane fuel, the engine has slightly greater efficiency, because the effective compression ratio is higher. The trade off is fuel cost. It's usually about a wash in \$/mile, but you do get higher peak performance (max power) with higher octane, if that's important.

WWII avgas ran about 130 octane for that reason. Regular autogas runs about 87 octane, because it's hard to get octane boosters (like tetraethyl lead) approved now. That's one, if not the only, benefit of using ethanol. It boosts octane and is thought to be safe (as was MTBE when it was mandated).

Regards,

Bill Ward

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