

Health and Science Series

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FUEL EFFICIENCY MEASURES

OBVIOUS AND SUBTLE

People have never been more concerned with reducing fuel consumption and increasing vehicular performance because of **ever rising energy costs**. There are many measures that can be taken to improve combustion engine vehicle (diesel and gasoline) efficiency. Some are quite obvious while others are less apparent. An informative review of these measures at this time may be worthwhile for most vehicle operators.

More than **\$500 million per day** is spent in the U.S. alone by Americans to fuel their cars, SUVs and light trucks. These vehicles account for **45% of U.S. oil consumption**, a whopping 8.8 million barrels a day (mbd). Gasoline use is rising with a continual increase in the number of vehicles and miles being driven. (1).

Some simple ways to increase fuel efficiency and some less evident include the following:

1. Don't drive aggressively. Aggressive driving reduces mileage by **33% on the highway and 5% in the city**. Jackrabbit starts at stoplights waste fuel and add unnecessary wear and tear to your vehicle.
2. Don't stop abruptly. Smooth stops increase vehicle fuel efficiency.
3. Maintain smooth, constant speed (cruise control on the highway) to improve mileage.
4. Don't drive at excessive speeds. The faster you drive, the more fuel you waste. Driving at 75 mph instead of 65 mph lowers fuel economy by 10%. Fuel economy drops **17% by driving at 70 mph versus 55 mph**. Most autos and small trucks are most fuel efficient between 35 and 45 mph.
5. Use overdrive gears on the highway to improve fuel economy. Fuel consumption is reduced because of the decreased engine speed in overdrive.
6. Lighten your vehicle's burden. Fuel consumption is increased **4% for each extra 100 pounds** of load.

7. Avoid using roof racks. Wind drag from a rack increases fuel consumption about one mpg. A loaded roof rack can reduce your vehicle's mileage by 5%.
8. Use air conditioning sparingly to avoid a **10% to 20% reduction in fuel economy**. Clear hot air initially through windows, vents and sunroof before starting the air conditioner. (2).
9. Avoid idling your engine whenever possible. Fuel economy is **zero mpg while idling**. It is better to restart the engine rather than running it more than 30 seconds. Modern vehicles don't need warm up.
10. Don't rest your foot on the brake pedal when driving. The drag this causes requires additional fuel.
11. Keep tires properly inflated to the maximum recommended pressure. There is a **1% drop in mpg for every pound below this level**. (3).
12. Get regular tune-ups, replacing worn spark plugs, clogged fuel and dirty air filters to get as much as **10% better fuel efficiency**. One spark plug misfiring half the time reduces fuel economy by 7% and two by 20%.
13. Use the fuel octane level just high enough to prevent engine knocking. This is what is usually recommended by the manufacturer, since a **higher than necessary octane rating does not improve a vehicle's mileage**.
14. Expect lower mileage at colder temperatures in the winter as compared to higher temperatures in the summer. This is due to increased air density with concomitant wind resistance at lower temperatures. Fuel efficiency drops more than 18% from 90 degrees Fahrenheit to -10 degrees Fahrenheit.
15. Use multi-viscosity motor oils since they **improve mileage 3% to 8%**.

It should be noted that real gas mileage is **actually 20% to 25% lower than EPA ratings** and let us be honest. It is difficult (if not next to impossible) for most of us to consistently address **ALL** the measures described here to maintain our vehicles peak energy efficiency performances. Certainly we must all try, but **installing a Fuel Fx Reactor to increase fuel efficiency through better combustion processes goes a long way in compensating for our deficiencies**.

Even if all the measures described here were observed **routinely**, the **Fuel Fx Reactor would still improve vehicle fuel efficiency with significantly better mpg, along with increasing horsepower, lowering emissions and decreasing undesirable mechanical vibration and noise**.

REFERENCES

1. Alliance to Save Energy: Increasing vehicle fuel efficiency, *Fact Sheet*, policyinfo@ase.org, May 2004.
2. Lazarony, L.:10 ways being a smart driver saves you gas, *Bankrate.com*, July 20, 2004.
3. State of Idaho Department of Environmental Quality: Pollution prevention and air quality, *Air Quality*, 2004.