

Talking Points

8-14-07

E85 Fuel

Will ethanol blends hurt my car?

- Most current vehicles are designed to run on up to 10% ethanol. Flex Fueled Vehicles (FFV) are designed to use up to 85% ethanol or regular petroleum gasoline without damaging the vehicle.
- Got to www.e85fuel.com to see if your vehicle is a FFV or to look for your next vehicle purchase.

Can vehicles use pure ethanol?

- Currently, there are no cars in the US that are approved to use 100% ethanol.
- Brazil has a significant number of vehicles currently using close to 100% ethanol, but the U.S market has yet to introduce a vehicle or the fuel for such usage.

I want to start using E85 in my older FFV. Do I need to do anything special?

- Depending on the mileage and how your vehicle has been maintained, you may need to check and change the fuel filter after the first couple of tanks of E85. Ethanol acts as a solvent and will clean out your fuel system by keeping injectors and other components clean, but may deposit these materials into your filter.

What could happen if I use E85 in my non-FFV? My neighbor has used E85 in his non-FFV for many months and he sees no problems. His car works great on E85.

- E85 reacts with certain materials in non-FFV engines causing them to be weakened or fail and also has an oil washing affect on the cylinder walls. FFV engines and components have been manufactured with the appropriate materials to handle these affects and will not be damaged by E85 usage.
- Short term, there may be minimal affects and the vehicle may respond well to the improved octane. Over time, a check engine light may be illuminated, the fuel filter may plug, and the fuel pump may fail. At a minimum, you may have to have the vehicle towed to a service facility and have the fuel tank drained, and fuel filter replaced.
- Long term affects of E85 in a non-FFV may be seen in premature failures of gaskets, seals, valve seats, fuel system, piston rings and cylinder walls.

Can I convert my vehicle to run on E85?

- Either the Environmental Protection Agency (EPA) or California Air Resource Board has to approve any conversion kit that changes the fuel type an engine uses. This is because the original engine was manufactured to meet certain air quality standards; the conversion must also meet those standards.
- There is currently no approved conversion kit on the market. Two conversion companies have been given letters by the EPA, but those letters do not certify the conversion kits.
- Installation of a conversion kit could result in damage to the car or a fine imposed to the owner of the car by air quality or other regulatory officials for engine tampering.
- The conversion kits on the market usually incorporate some way of increasing the amount of fuel to the engine. When installed and the owner switches back to unleaded fuel, the engine may not run well because the engine is getting too much fuel to have proper combustion. This could result in higher emissions. Also, if the fuel pump is not designed for the higher volume, there may be a premature fuel pump failure.

- The larger issue is that most conversion kits do not replace materials that are not E85 compatible. Long term negative affects to the life of the engine may be significant and not covered under warranty.

Do I have to use special oil for my FFV when using E85?

- Most Original Engine Manufacturers (OEM) indicate that there are no changes in oil needs. However, follow the OEM's recommendations for required oil specifications and oil change intervals.

Fuel Economy

- The Fuel Economy Guide (www.fueleconomy.gov) indicates a range of 20-35% fuel economy reduction when FFVs use E85 vs. gasoline. This is because the energy content of E85 is between 20% and 37% less than gasoline on a per-gallon basis.

Is there anything I can do to improve the fuel economy when I'm using E85?

- The lower energy content of E85 makes the fuel economy lower no matter what you do. Information from www.fueleconomy.gov, shows MPG reductions from 20-35% when using E85. With that being understood, driving habits, routine maintenance, proper tire inflation and reduced excess weight are all things that significantly aid in improving fuel economy.

Why does the price of E85 fluctuate more than gasoline?

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Does using E85 have greenhouse gas emissions impact?

- The use of ethanol reduces greenhouse gas (GHG) emissions (GHG emissions are linked to climate change).
- On a per-gallon basis, corn ethanol could reduce GHG emissions by 18% to 28% when the complete life-cycle of the fuel is considered.
- Cellulosic ethanol (ethanol made from plant fiber materials) offers an even greater benefit, at 87% reduction in GHG emissions of the life cycle of the fuel. (Source- [Argonne National Laboratory Report ANL/ESD/06-7: Fuel-Cycle Assesment of Selected Bioethanol Production Pathways in the United States. M. Wu, M. Wang and H. Huo, Nov. 7, 2006.](#))
- Compared with the life cycle of gasoline, cellulosic ethanol from corn stalks and leaves reduced GHG emissions by 40%, reed canary grass by 85%, and switchgrass and hybrid poplar by 115%. (Source - a U.S. Department of Agriculture and Colorado State University study: *Life-Cycle Assessment of Net Greenhouse-Gas Flux for Bioenergy Cropping Systems. Paul R. Adler, Stephen J. Del Grosso, and William J. Parton, April 2007.*)

Tailpipe emissions

- Some pollutants in tailpipe emissions are reduced significantly, others are increased.
- Compared to gasoline in Tier 2 (passenger type) vehicles, ethanol produced the following emissions:
55% to 70% less benzene, 1,3-butadiene, & PM2.5 when tested at 72°F
19% less benzene and 69% less PM2.5 when tested at 20°F
2 to 3 times more NMHC when tested at 20°F
50 to 120 times more acetaldehyde when tested at both 20°F and 72°F
2 to 4 times more formaldehyde when tested at both 20°F and 72°F

(Source: SRI and EPA study presented March 2007 at CRC)

How much energy is needed to produce E85?

- The *fossil* energy input per unit of ethanol is lower than the *fossil* energy needed to produce an equal unit of gasoline.
- Fossil energy needed to produce ethanol is 0.76 million British thermal units (Btu) per 1 million Btu of ethanol delivered.
- Fossil energy needed to produce gasoline is 1.22 million Btu per 1 million Btu of ethanol delivered. (Source- [Argonne National Laboratory Report ANL/ESD/06-7: Fuel-Cycle Assessment of Selected Bioethanol Production Pathways in the United States](#). M. Wu, M. Wang and H. Huo, Nov. 7, 2006.)

How FFVs are on the road in the US?

- Over 6 million with a commitment from all domestic OEMs to increase FFV production each year.
- Go to the [State of Colorado webpage](#) to view the population of FFVs in your zip code.

How many E85 stations are there in the US?

- Over 1100, and growing each month. The majority of stations are in the US Corn Belt region, or in areas where air quality concerns are prevalent.
- Got to the [National Ethanol Vehicle Coalition website](#) to find stations near you.

How much ethanol is produced in the US compared to the demand?

- In 2006, US ethanol demand was 5.4 billion gallons with U.S. production capacity at 4.9 billion gallons.
- This supply constraint is being addressed; as of July 2007, 86 plants were under construction or expanding for an additional 6.4 billion gallons per year capacity. Also as of July 2007, the 119 existing ethanol refineries produced almost 6.2 billion gallons per year. (Source- [Renewable Fuels Association \(RFA\)](#))

Does using ethanol for fuel reduce the amount of corn available for food?

- The United States has typically accounted for 60-70% of world corn exports. With the expansion of fuel ethanol and higher corn prices, the U.S. share of global corn trade drops to 55-60%. Global adjustments to higher corn prices include reduced foreign demand and increased foreign production.
- In the years 2005 and 2006 12% of US corn harvested was used for food, seed and industrial ethanol.
- 55% was used for livestock feed.
- Residual distillers grain (left over protein meal from ethanol production) goes back into the livestock feed stream at approximately one fifth of every bushel of corn distilled.
- Corn yields have grown from 126.5 bushels per acre in 1996 to an estimate of 153.5 in 2006. Biotechnology is helping seed companies develop improved corn varieties. Such improvements include higher-oil yield; high fermentable starch; drought-tolerant seeds and plants; a reduced the need for herbicides and pesticides and better nutrient uptake. (Source- [Ethanol Expansion in the United States: How will the Agricultural Sector Adjust?/ FDS-07D-01 Economic Research Service/USDA.](#))

How much water does it take to produce a gallon of ethanol compared to gasoline?

- Ethanol production plants use 3- 4 gallons of water to produce 1 gallon of ethanol.
Source: *RFA*
- Articles and calculations claim it takes 985 or more gallons of water to grow the corn to produce one gallon of ethanol. These figures appear to be the total water needed and do not take into account existing soil moisture and growing season rainfall. Based on where the corn is grown, there may be very little supplemental water required. Conversation with USDA.
- A Google search shows that it takes 1851 gallons of water to refine one barrel of crude oil. (no references given) According to Energy Information Agency, 1 barrel of crude oil produces 19.6 gallons of finished motor gasoline. This translates into 94 gallons of water per gallon of gasoline for refining.