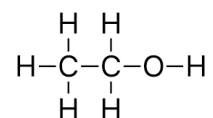


# Rider Education Report

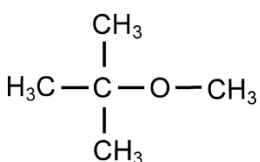
## Fuel Part 2

The energy of gasoline and ethanol is stored in the Carbon-Hydrogen bond.

Ethanol's chemical formula is C<sub>2</sub>H<sub>5</sub>OH



Gasoline's chemical formula is C<sub>8</sub>H<sub>18</sub>



Examining the chemical formula of the two fuels clearly shows that gasoline has more energy per molecule and is one reason our motorcycles get less mileage from a gallon of standard retail gasoline with 10% ethanol than from a gallon of pure gasoline. Another reason is because the ethanol is blended with a denaturant to make it undrinkable. This chemical does not add any energy to the fuel. The amount of denaturant can be up to 2% of the volume of ethanol added.

Most gasoline available at retail pumps in the USA contains about 10% ethanol by volume. In 2023, about 330 million barrels of ethanol were blended into the 3.26 billion barrels (more than 137 billion gallons) of gasoline that were consumed.

The blending of ethanol with gasoline occurs in the United States to meet the requirements of the 1990 Clean Air Act and the Renewable Fuel Standard established in the Energy Independence and Security Act of 2007. There are three general categories of ethanol-gasoline blends: E10, E15, and E85. Most retail gasoline sold in the USA is E10, which contains up to 10% ethanol. E15 is gasoline blended with up to 15% ethanol. And likewise, E85 is gasoline blended with up to 85% ethanol. The ethanol content of the gasoline is usually indicated on the pump. According to the US Environmental Protection Agency, all motor vehicle engines can use E10 gasoline. However, our motorcycles, lawn mowers, side-by-sides, etc., are all considered "small engine" designs and normally are not designed to operate with E10. The ethanol in the gasoline blend can dry out seals and gaskets. The chemical denaturant left behind after evaporation can clog small orifices in the fuel system. Always check your owner's manual for the recommended fuel for your vehicle. Currently, only designated flex-fuel vehicles built after 2001 can use E15 or E85 fuels.

Richard Artmayer  
KY District Educator