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***FFI PLATINUM EDITION***  
***ETHANOL CONVERSION SYSTEM***

**OWNERS MANUAL**

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## ***MESSAGE FROM FFI***

Thank you for your purchase of the FFI Platinum Ethanol Conversion System. Add more here...

## ***INSTALLATION AND SERVICE***

Installation and service of the FFI Platinum Edition Ethanol Conversion System should be performed by qualified personnel experienced with automotive mechanics. Technical information on installation, adjustment, and advanced troubleshooting is covered in the FFI Platinum Edition Technical Manual.

## ***E85 – A DRIVER'S POINT OF VIEW***

Just as there are differences between gasoline and diesel, there are differences between gasoline and E85. To obtain the most satisfying results from the vehicle, the driver should understand these differences. Don't worry; you need not be a chemist.

### ***Miles Per Gallon***

Nearly all vehicles will get less MPG on E85 than gasoline. By volume, E85 has about 28% less energy than gasoline, which determines how much heat is released when it is burned. Fortunately, E85 has properties which help it more efficiently convert energy into work. This can reduce the MPG loss for most engines and many people see losses of between 10% to 20%. The lower MPG will affect vehicle range and you should plan accordingly to not run out of fuel.

Alcohol is a performance fuel and many vehicles have a significant increase in torque and power with E85. Please use this extra performance responsibly. Driver behavior has a large impact on MPG. Aggressive driving destroys MPG. It can also be very dangerous, destroying vehicles, lives, and whatever you run into when you lose control of your vehicle.

***SPEEDING IS DANGEROUS AND UNLAWFUL  
IF YOU WANT TO RACE, PLEASE TAKE IT TO THE TRACK.***

### ***RESULTS WILL VARY***

Engines with higher compression ratios and advanced technologies tend to take more advantage of the fuel differences. FFI is interested to hear from you about your results. Please visit our owner's forum and let us know.

## **Fuel Quality**

With any type of fuel, quality is important and greatly influences performance, efficiency, and reliability. Selecting a high quality fuel helps keep your vehicle running well. Ethanol is ethanol, but E85 has much more to it than the ethanol. You should use E85 that meets or exceeds the ASTM D5798 specification. Use of fuel that fails to meet this quality standard could impair vehicle performance, may lead to early parts failure, and will void your warranty. If you are purchasing E85 at a retail dispenser pump, you should have no troubles. If you are distilling and blending your own fuel, you will need to make certain your fuel quality meets or exceeds this standard.

## **Vapor Pressure**

Vapor pressure is a measure of the ability for a substance to evaporate. A liquid with a high vapor pressure will evaporate easier than a liquid with a lower vapor pressure. Ethanol has a lower vapor pressure than gasoline. Consequently, ethanol will vaporize more slowly than will gasoline, particularly when it is cold. Spark ignited engines must vaporize their fuel before it burns. E85 is mostly ethanol with a little gasoline blended in. The gasoline content raises the fuel's vapor pressure above what you would have just with pure ethanol and helps with engine starting. The ASTM D5798 fuel specification specifies the amount of gasoline that should be blended into the fuel based upon climate and season. If you are expecting extremely cold weather or live in a warm area but will be parking overnight at high altitude where it will be cold, you may wish to add a gallon or two of gasoline to your fuel tank. This will increase the vapor pressure of your fuel and make for easier starting.

## ***COLD STARTING PROCEDURE***

Standards compliant fuel, combined with the FFI Cold Start Assist (tm), should result in reliable engine starting. If you are having difficulty with cold engine starting, please check with your fuel retailer to see if they are following the ASTM D5798 seasonal blending procedures.

Once your engine starts and runs smoothly, it is recommended to let it idle for a few moments before driving. Fuel vaporization cools the intake air and ethanol has substantially more cooling effect than gasoline. This extra cooling effect is one of the reasons E85 is generally more efficient in the conversion of energy into work, but in the first few moments of starting a cold engine, it prevents the rapid vaporization of fuel. Once there is a bit of warmth in and near the cylinders, fuel vaporizes more quickly.

*You need not idle long enough for the temperature gauge to rise.*

The temperature gauge in the dashboard measures engine coolant temperature but it is not the coolant that vaporizes the fuel but rather the warmth of the inner surfaces of the cylinder and the area of the intake manifold near the fuel injectors. This area of the engine develops the necessary warmth fairly quickly. The amount of time you should idle will depend on the initial temperature at engine start and will also vary somewhat from engine to engine.

In mild weather, FFI recommends an idling period of 15 to 30 seconds with the transmission in Neutral prior to driving. Initial power demands placed upon the engine should be light. If you will need to immediately pull into traffic on a busy street or highway, please allow some additional warm up time. High power demands require high vaporization rates. If there is insufficient warmth near the fuel injectors, the fuel won't burn correctly and the engine could balk.

## ***VEHICLE MAINTENANCE***

It is important that you have routine preventative maintenance work performed on your vehicle as recommended by your vehicle owner's manual. Generally, you need do nothing special for maintenance when using E85 but there are a few things to keep in mind.

Vehicle owner's manuals recommend more frequent oil changes for harsh service. With E85, most vehicles have more power, which is great, but that also means you could well be demanding more from your engine oil. High quality lubrication is always a good investment. FFI recommends use of high quality synthetic or synthetic blend oil and that the oil and filter be changed on schedule according to the engine manufacturer's recommendations.

Properly working oxygen sensors are important to reduce emissions and maximize fuel economy. They are also critical to flex fuel operation. Oxygen sensors usually fail due to contamination and routine use of E85 should keep them nice and clean but even clean oxygen sensors eventually wear out and should be replaced. Oxygen sensors are often overlooked when performing preventative maintenance. It is best to replace oxygen sensors on schedule rather than waiting for them to fail.

Fuel filters are often neglected until they plug and leave the driver stranded. Changing them now and then is a much better plan. Ethanol also cleans your fuel system. If your vehicle operated on gasoline for several years prior to conversion, the inside of your tank will likely be coated with olefins, a substance in gasoline much like candle wax. The olefins deposit will trap super fine sediment from the gasoline. After a few tanks of E85, the olefins will have been removed and the sediments they held will be trapped in the fuel filter. It is therefore recommended that the fuel filter be checked after the first few tankfuls of E85 and changed if needed.

## ***MIL OR CHECK ENGINE LIGHT***

If your Check Engine or Malfunction Indicator light turns on, you need to have the issue investigated and corrected.

### **If the light is flashing:**

A flashing MIL indicates a serious fault condition. If this happens, you should not operate the vehicle any longer than necessary to reach a place of safety.

### **If the light is on but not flashing:**

This indicates a less serious fault condition. It needs to be corrected, but should not cause any immediate harm. Make an appointment with your mechanic to identify and correct the problem.

### **Recently converted vehicles:**

If your vehicle has recently been converted, chances are that an adjustment to the conversion system is all that is needed. The FFI installer is trained in making these adjustments.

### **Technical Support:**

Technical support is available to any automotive technician. Our toll free number is 866-568-3617. FFI is also available via live chat through our website at <http://fuelflexinternational.com>

## ***ETHANOL CONVERSION AND YOUR OEM VEHICLE WARRANTY***

Many vehicle manufacturers state that using ethanol in their vehicle will void the warranty. First thing to remember is that there are laws that regulate the limiting and/or voiding of warranties. Any voiding of the warranty should be done only upon actual cause of damage. Further, any voiding of warranty coverage should be limited to the affected parts. Certainly components of the vehicle unrelated to the fuel system should not have their warranty affected by using ethanol. If your radio breaks, the power mirrors quit working, or something unrelated to fuel fails under warranty and the manufacturer tries to claim it was caused by ethanol, please have them put it in writing. It is likely they are violating the law, but regardless, we'd love to put that on our website!

If a part fails which does have something to do with the fuel system and the manufacturer tries to claim it was caused by the ethanol, there should be evidence of ethanol related corrosion. Parts fail, with or without ethanol, and to presume that once ethanol has been used in the vehicle that it is responsible for all failures is unrealistic. If there is evidence of ethanol corrosion and the repair would otherwise be covered by the manufacturer's warranty, have the manufacturer's representative complete FFI's affidavit of ethanol corrosion failure. Send this, together with the repair invoice and the failed part with the ethanol corrosion to FFI for reimbursement.

Bottom line, if a manufacturer chooses to void their warranty, they should show reasonable cause to do so based upon the evidence of the part failure. Otherwise, they should honor their warranty. If they can't show evidence of ethanol corrosion and won't honor their warranty, please get that in writing as we would also love to put that on our website.